RHIC 2003 – 2004 Physics Run
Daily Quench Analysis for the month of April 2004

April 2, 2004 Maintenance of 6 Hours, start time 0700.

Friday-April 02, 2004: PR-157, Blue Quench: File# = 1080935356

Permit ID: **8b-ps1** Timestamp: **14:49:16 +304105** Beam Permit Fail Timestamp: N/A, Down from Maintenance
QPAControl / Timing Resolver: N/A
Quench Detector(s) Trip: 8b-qd1 in the pink
5 Minute: Quench Delay File: None initiated.
Main Magnet Power Status / Postmortem: Supplies sitting at Zero Current.
Beam Loss Monitors (Rads/Hr): N/A
DX Heaters: 8b-ps2.A1 Off, 8b-ps2.A2 Off, 8b-ps2.B1 Off, 8b-ps2.B2 Off (All four fired)

QLI Recovery TAPE / PS On Checks Commenced: **15:19:29** Estimated Delay Time: 49 minutes
----- Checking PS All -----
qed: psall stateReq->Send error: -1
qed: psall stateReq->Send error: -1

Tech Notes / Sequence of Events: Dx heaters fired but due to magnets at zero currents, Real Magnet Quenches did not occur.
14:49: Quench Link Interlock in Blue ring, 8b-ps1 dropped first Sequencer
14:55: The fec for 8b-qd1 needed to be re-booted. Ganetis [quench]

14:53: We have ramped the snake magnets in sector 3 and 9 to their operating currents. The ramp recipes from last year are still in effect. During the 3 day shout-down we might try to speed up some of the ramps.
We also tested all the spin rotators in sector 8 to 250 Amps. The ground fault was cleared in yellow sector 3 and it was an easy fix. Ganetis [quench]

Quench Analysis: Quench Detector Fault, 8b-qd1 FEC re-booted.

Friday-April 02, 2004: PR-158, Yellow Quench: File# = 1080935516

Permit ID: **7b-ps1** Timestamp: **14:51:56 +856257** Beam Permit Fail Timestamp: N/A, Down from Maintenance
QPAControl / Timing Resolver: N/A
Quench Detector(s) Trip: 7b-qd1 in the pink
5 Minute: Quench Delay File: None initiated.
Main Magnet Power Status / Postmortem: Supplies sitting at Zero Current.
Beam Loss Monitors (Rads/Hr): N/A
Postmortems / Snapshot: N/A
DX Heaters: 8b-ps2.A1 Off, 8b-ps2.A2 Off, 8b-ps2.B1 Off, 8b-ps2.B2 Off

QLI Recovery TAPE / PS On Checks Commenced: **15:48:47** Estimated Delay Time: 56 minutes

Tech Notes / Sequence of Events:
14:51: Quench Link Interlock in Yellow ring, 7b-ps1 dropped first Sequencer
14:57: The fec for 7b-qd1 needed to be re-booted Ganetis [quench]

14:53: We have ramped the snake magnets in sector 3 and 9 to their operating currents. The ramp recipes from last year are still in effect. During the 3 day shout-down we might try to speed up some of the ramps.
We also tested all the spin rotators in sector 8 to 250 Amps. The ground fault was cleared in yellow sector 3, it was an easy fix. Ganetis [quench]

Quench Analysis: Quench Detector Fault, 7b-qd1 FEC re-booted.

RHIC 2003 – 2004 Physics Run
Daily Quench Analysis for the month of April 2004

Friday-April 02, 2004: **PR-159, Blue Quench: File# = 1080936601**
Permit ID: **8b-ps1** Timestamp: **15:10:00 +1565085** Beam Permit Fail Timestamp: N/A, Down from Maintenance
QPAControl / Timing Resolver: b8-q89-qp, no faults listed.
Quench Detector(s) Trip: No alarms listed.
5 Minute: Quench Delay File: Systems found running, no indications.
Main Magnet Power Status / Postmortems: Mains at Park Current.
Beam Loss Monitors (Rads/Hr): No beam in the machine.
DX Heaters: None Fired.
QLI Recovery TAPE / PS On Checks Commenced: **??** Estimated Delay Time: ?? minutes

Tech Notes / Sequence of Events:
15:10: Quench Link Interlock in Blue ring, 8b-ps1 dropped first Sequencer
15:44: blue quench link trip was caused by 8b-q89 cable between ps and qpa. This happen when the ps was being turned on. Ganetis [quench]
Quench Analysis: IR Supply Fault, Possible 8b-q89 cable between ps and qpa.

Friday-April 02, 2004: **SQ-001**
Snake Quench Identified, Yellow-3c-ps1: yi3-snk7-2.3
Event Timestamp: Snapshot Plot, 16:42:06
3c-QPA Control / Timing Resolver: No faults listed.
Power Supply Status: Supply steady at Idle Current of 1.08 amps when the Voltage and Current spiked causing the quench detector to trip the supply. Maximum levels at trip: Current = 5.53 amps, voltage = 8.55 volts. Iref remained constant therefore eliminating the current regulator card for relay setpoint un-stabilization.
Beam Loss Monitors (rads/hr): No beam in the machine.
Estimated Down Time: N/A was able to reset. Estimated Recovery Time: N/A

Tech Notes / Sequence of Events:
Coming off maintenance and machine turned over for physics.
Quench Analysis: Power Supply Fault.

Friday-April 02, 2004: **SQ-002**
Snake Quench Identified, Yellow-3c-ps1: yi3-snk7-2.3
Event Timestamp: Snapshot Plot, 23:02:08
3c-QPA Control / Timing Resolver: Crowbar
Power Supply Status: = Qdplots show Ramping upwards, tripping at 21.97 amps.
Beam Loss Monitors (rads/hr): N/A

Snake Quench Identified, Yellow-3c-ps1: yo9-snk7-2.3
Event Timestamp: Snapshot Plot, 23:02:10
9c-QPA Control / Timing Resolver: No faults indicated.
Power Supply Status: = Qdplots show Ramping upwards, tripping at 23.4 amps.
Beam Loss Monitors (rads/hr): N/A
Estimated Down Time: N/A, Non Equipment Failure. Estimated Recovery Time: N/A

Tech Notes / Sequence of Events:
22:48: All snakes on at 1 A. I will now ramp the yi3-snk7-2.3 and yo9-snk7-2.3 supplies up to 50 Amps in 30 seconds keeping the ramp rate under the 0.5A/s as indicated in Don's instructions. I am using the pet page to ramp the magnets for now. We will first make an average orbit from the turn-by-turn measurement. waldo [rhic ps]
23:06: Got a quench at about 22 A. This very well may be that bloody D-connector. waldo
23:12: Waldo, you *&%###!# bloody idiot. That was way too fast. You needed to multiply by 2 not divide by 2. I should put in 120 s for 50A from 1A. waldoops [rhic ps]
Quench Analysis: Wrong Ramp Rate.

Saturday-April 03, 2004: SQ-003
Snake Quench Identified, Yellow-9c-ps1: yo9-snk7-2.3

Event Timestamp: Snapshot shows quench starting at 03:12:35
9c-QPA Control / Timing Resolver: No faults indicated.
Power Supply Status: = At operating current of 328 amps
Beam Loss Monitors (rads/hr): No affect.

Snake Quench Identified, Yellow-9c-ps1: yo9-snk7-1.4

9c-QPA Control / Timing Resolver: No faults indicated.
Power Supply Status: = Operating Current of 100 amps.
Qdplots: Indication of perturbation (heat transfer) taking place 1.72 seconds after yo9-snk7-2.3 quenched.

Tech Notes / Sequence of Events:
MCR Reported at 03:12: The yo9-snk7-1.4 and yo9-snk7-2.3 snakes have quenched. Cryo personnel have been contacted.
04:05: acnlin46 was powered off and on due to its languid response.
04:15: Cryo has given permission to ramp the yellow snakes in 9 o'clock.
05:29: RHIC hysteresis ramp. BLIP running.

Estimated Down Time: N/A, Non Equipment Failure. Estimated Recovery Time: N/A

Tech Notes / Sequence of Events:
3:14: After vertical orbit correction from s=1000m to s=1200m, intensity drops, Yellow snake quenches. Will recover and revert orbit correction. Wolfram
8:18: Could people use the GPM for protons rather than gold? waldo [rhic config]
9:23: Could have caught it if I had armed the snake blms.;) Mei

Quench Analysis: SQ Beam Induced Quench #001

Saturday-April 03, 2004: SQ-004 Snake Quench Identified, Yellow-3c-ps1, File#: 1081043412

Snake Permit Fail Timestamp: **20:50:12 + 225980** Beam Permit Fail Timestamp: **20:50:12 + 226020**

Magnet / Power Supply Identity: **yi3-snk7-2.3**
3c-QPA Control / Timing Resolver: Crowbar
Power Supply Status: = at operating current of 326 amps
Beam Loss Monitors (rads/hr): Monitors around the 3C Snake Magnets, minimal to none.

Magnet / Power Supply Identity: **yi3-snk7-1.4**
3c-QPA Control / Timing Resolver: No faults indicated.
Power Supply Status: = Operating Current of 99.91 amps.
Qdplots: Indication of perturbation (heat transfer) taking place 2.38 seconds after yi3-snk7-2.3 quenched.

Estimated Down Time: N/A, Non Equipment Failure. Estimated Recovery Time: 85 minutes
Tech Notes / Sequence of Events:
20:50: Beam Abort, 3c-ps1 dropped {Quench - snake} Sequencer
20:50: The yi3-snk7-1.4 and yi3-snk7-2.3 have quenched. The Snapshot data show a jump in the current reference for the yi3-snk7-2.3 supply from 326 amps to 360 amps. A yellow QLI occurred less than one second after the snake quench. G. Ganetis reported that the yellow quench at Y3QDQ8_VT was due to warm gas from the snake quench.
21:03: Both YELLOW snakes quenched. Expect at least one hour to recover.
22:15: Cryo has given permission to recover the yellow snakes and to ramp the RHIC mains. The snakes are being recovered.
23:34: yi3snk7-2.3 tripped because the ps had a sudden jump in current. This caused the quench detector to trip. Then 2.4 sec later yi3snk7-1.4 quenched due to warm gas from yi3snk7-2.3 tripping and then quenching. Ganetis [quench]

Quench Analysis: Snake Power Supply Fault

Saturday-April 03, 2004: PR-160, Yellow Quench: File# = 1081043413

Permit ID: **4b-time.A** Timestamp: **20:50:12 +1609804** Beam Permit Fail Timestamp: **20:50:12 + 225984**
QPAControl / Timing Resolver: y-QD-QLI
Quench Detector(s) Trip: (4b-qd2) Y3QDQ8_VT, Int. 20, Tq=-23
5 Minute: Quench Delay File: No indications listed.
Main Magnet Power Status / Qdplots: Dipole & Quad running steady at Injection Current
Beam Loss Monitors (Rads/Hr): No affect on this Quench.
Postmortems / Snapshot:

QLI Recovery TAPE / PS On Checks Commenced: **21:28:25** Estimated Delay Time: 38 minutes

Tech Notes / Sequence of Events:
20:50: The yi3-snk7-1.4 and yi3-snk7-2.3 have quenched. The Snapshot data show a jump in the current reference for the yi3-snk7-2.3 supply from 326 amps to 360 amps. A yellow QLI occurred less than one second after the snake quench. G. Ganetis reported that the yellow quench at Y3QDQ8_VT was due to warm gas from the snake quench.

23:40: yellow quench link trip was caused by 4b-qd2 quench detector. The quench detector tripped because of a real bus quench at Y3QDQ8_VT. The beam permit tripped before the yellow quench link. The bus quench was caused by warm gas from the snake yi3-snk7-2.3 tripping and then quenching. Ganetis [quench]

Quench Analysis: Warm Gas from Yellow 3C Snake quench.

Sunday-April 04, 2004: SQ-005 Snake Quench Identified, Yellow-3c-ps1, File#: 1081089358

Snake Permit Fail Timestamp: **10:35:56 + 2328538** Beam Permit Fail Timestamp: **10:35:56 + 2328578**

Magnet / Power Supply Identity: **yi3-snk7-2.3**
3c-QPA Control / Timing Resolver: No faults indicated.
Power Supply Status: = at operating current of 326 amps when the Iref is seen dropping from 326 amps to 315 amps for one second before the current responded. Supply tripped off indicating Error and was verified by this process.
Beam Loss Monitors (rads/hr): Monitors around the 3C Snake Magnets, minimal to none.

Magnet / Power Supply Identity: **yi3-snk7-1.4**
3c-QPA Control / Timing Resolver: No faults indicated.
Power Supply Status: = Operating Current of 99.93 amps.
Qdplots: Indication of perturbation (heat transfer) taking place 2.39 seconds after yi3-snk7-2.3 quenched.

Estimated Down Time: N/A, Non Equipment Failure. Estimated Recovery Time: N/A

Tech Notes / Sequence of Events:
10:36: Beam Abort, 3c-ps1 dropped {Quench - snake} Sequencer
10:41: Quench happened during second test of RF loops in Yellow.
11:24: yi3-snk7-2.3 tripped because the ps had a sudden drop in current. This caused the quench detector to trip. Then 2.4 sec later yi3-snk7-1.4 quenched due to warm gas from yi3-snk7-2.3 tripping and then quenching. This is an on going ps problem with yi3-snk7-2.3. It has tripped at least once a day. D. Bruno should get time to fix this. This was not caused by any beam loss. Ganetis [quench]
15:11: In reference to yi3-snk7-2.3-ps trips, was called in to work on the supply. However, due to continued RF work, access was not permitted. After a two-hour wait, MCR and I consulted, Power Supply was running and had not tripped since. Decision was made to leave. Note, there is scheduled maintenance starting is in the morning. Talked to Don Bruno over the phone, at his request since he is not near a computer, he asked that I put this entry into the log and if there are any more trips, he should be called. G. Heppner [rhic ps]

Quench Analysis: Snake Power Supply Fault

Sunday-April 04, 2004: PR-161, Yellow Quench: File# = 1081089359

Permit ID: **4b-time.A** Timestamp: **10:35:56 +3710913** Beam Permit Fail Timestamp: **10:35:56, 2328543**
QPAControl / Timing Resolver: y-QD-QLI
Quench Detector(s) Trip: (4b-qd2) Y3QFBU9_7VT, Int. 20, Tq=-22
5 Minute: Quench Delay File: No indications listed.
Main Magnet Power Status / Qdplots: Dipole & Quad running steady at Injection Current
Beam Loss Monitors (Rads/Hr): No affect on this Quench.
Postmortems / Snapshot:

QLI Recovery TAPE / PS On Checks Commenced: **11:23:34** Estimated Delay Time: 48 minutes

Tech Notes / Sequence of Events:
11:25: yellow quench link trip was caused by 4b-qd2 quench detector. The quench detector tripped because of a real bus quench at Y3QFBU9_7VT. The beam permit tripped before the yellow quench link. The bus quench was caused by warm gas from the snake yi3-snk7-2.3 tripping and then quenching. Ganetis [quench]

Quench Analysis: Warm Gas from Yellow 3C Snake quench.

Monday-April 05, 2004: PR-162, Blue Quench: File# = 1081157710

Permit ID: **1b-ps1** Timestamp: **05:35:08 +2499524** Beam Permit Fail Timestamp: **05:35:08 + 2499554**
QPAControl / Timing Resolver:
Quench Detector(s) Trip: (1b-qd1) B12DSA4_A3VT, Int. 100, Tq=-24
5 Minute: Quench Delay File: None initiated.
Main Magnet Power Status / Qdplots: Qdplots show Dipole and Quad at Store Energy and begun to ramp down.
Dipole tripped at 1934 amps, Quad tripped at 1872 amps.
Beam Loss Monitors (Rads/Hr): No beam in the machine.
Postmortems / Snapshot: 1004b, Blue Main Dipole goes into oscillation when switching from Flat Top to Ramp Current.
DX Heaters: None Fired.
QLI Recovery TAPE / PS On Checks Commenced: **05:55:40** Estimated Delay Time: 20 minutes

Tech Notes / Sequence of Events: The quench link was pulled due to a quench detector at 1b-qd1 that picked up the Blue Main Dipole Power Supply as it had gone into oscillation when switching from Flat Top Current to Ramp Current. There was no beam in the machine at the time, A large spike on the dipole buss seen at B12DSA4_A3VT exceeded max limits. This is not a real magnet quench. Cause: Blue Main Dipole Power Supply, Oscillation. G. Heppner
5:35: Beam Abort, 1b-ps1 dropped Blue Quench Sequencer
5:39: This happened without beam. ad
5:46: Blue quench recovery sequence begun tape

Quench Analysis: Blue Main Dipole Power Supply.

Three-Day Scheduled Maintenance: **Monday April 5 to Wednesday April 7, 2004**

PR-163 blue time = 1081166527 = Mon Apr 5, 2004 08:02:04
PR-164 Yellow time = 1081166533 = Mon Apr 5, 2004 08:02:12

Tech Notes / Sequence of Events:
Scheduled Maintenance, MCR had given permission to take control of the Rings.
7:43: Dumping Beam and ramping down Sequencer
8:02: Quench Link Interlock in Blue ring, 4b-time.A dropped first Sequencer
8:02: Quench Link Interlock in Yellow ring, 4b-time.A dropped first Sequencer

Summary of Work Performed:

RHIC Power Supply Maintenance:

1) All snake and rotator p.s.'s checked for loose D connector connections.
2) Yo12-qgt-ps 3u control chassis swapped out
3) Yo12-qgt-ps and yo9-qgt-ps node card cables swapped out.
4) Bi12-qs3-ps corrector p.s. swapped out.
5) Y12-dh0-ps and b12-q6-ps had new pc board installed for aux contact fix.
6) The DCOC was adjusted to 175A on all qf8 and qf9 p.s.'s.
7) Spare sextupole current regulator cards were tested out.
8) Installed Voltage Monitoring boards in sector 10 for testing purposes. Don Bruno [rhic ps]

Summary of snake and rotator testing:

1) All snk7-2.3 have been tested to 336 Amps.
2) All snk7-1.4 have been tested to 120 Amps.
3) All rot3 have been tested to 300 Amps.
4) New ramp diagrams were made, only small changes were made, D. Bruno is distributing them.
5) Polarity checks were done on all snake and rotator circuits.
6) Diagnostic software has been modified and tested.

Other tasks done:

1) Both Rings were high potted; the leakage currents were very low.
2) Changed the quench protection dump resistors for the yellow ring dipole circuit at 1010A. They are now at their design values.
3) Installed a low-level chassis power supply on the top of b10q4. This is right by the blue abort dump. It is being monitored by a new 1-wire lead monitoring board. We will see if radiation effects this p.s.
Ganetis [quench]

Return To Physics!

Wednesday-April 07, 2004: **PR-165, Blue Quench: File# =1081353957**
Permit ID: **12a-ps1.A** Timestamp: **12:05:56 +1744545** Beam Permit Fail Timestamp: N/A (Maintenance)
QPAControl / Timing Resolver: b12-q7-qp, no faults indicated.
Quench Detector(s) Trip: All Running
5 Minute: Quench Delay File: None Initiated, running.
Main Magnet Power Status: Park Current
Beam Loss Monitors (Rads/Hr): No beam in the machine.
Postmortems / Snapshot: Nothing found unusual.
DX Heaters: None Fired.

QLI Recovery TAPE / PS On Checks Commenced: **12:21:11** Estimated Delay Time: 16 minutes

Tech Notes / Sequence of Events:

Recovering from Three-Day Maintenance, Snake and Spin Magnets ready to go for full operation for the Polarized Proton Run fy04.

Quench Analysis: Cable between power supply and QPA.

Thursday-April 08, 2004: **SQ-006 Snake Quench Identified, Blue-9c-ps1, File#: 1081409266**
Snake Permit Fail Timestamp: **03:27:44 + 2213701** Beam Permit Fail Timestamp: **03:27:44 + 2213742**

Magnet / Power Supply Identity: **bi9-snk7-2.3**
9c-QPA Control / Timing Resolver: No faults indicated
Power Supply Status: Ramping upward but tripped at 121.9 amps.
Beam Loss Monitors (rads/hr): No significant losses near the Blue Snake Magnet.

Magnet / Power Supply Identity: **bi9-snk7-1.4**
9c-QPA Control / Timing Resolver: No faults indicated
Power Supply Status: Unaffected
Qdplots:

Estimated Down Time: N/A, Non Equipment Failure. Estimated Recovery Time: 33 minutes

Tech Notes / Sequence of Events:
3:27: Beam Abort, 9c-ps1 dropped {Quench - snake} Sequencer
3:30: bi9-snk7-2.3-ps quenched during ramp up. Waiting on CCR approval to recover.
3:33: bi9-snk7-2.3-ps quenched during ramping. waldo
3:59: CCR has given permission to recover the snake. Waldo MacKay is ramping up the snake.
Snake quench recovery sequence begun on snake ps 9c-ps1.10J.
4:08: ramping bi9-snk7-2.3-ps waldo [blue injection ps]
4:32: Rotators and snakes are at operating currents. Waldo
10:16: Snake trip was caused by 9c-qd1 quench detector. The quench detector tripped because of a real quench in bi9-snk7-2.3 coil 3 inner. The magnet quench because it was ramped too fast. This magnet has a known problem with ramp rates. The rate that caused the quench was .66 Amps/sec. The normal rate for this magnet is .5 Amps/sec. Ganetis [quench]

Quench Analysis: Snk7-2.3, ramped too fast.

Thursday-April 08, 2004: SQ-007 Snake Quench Identified, Yellow-3c-ps1, File#: 1081417896

Snake Permit Fail Timestamp: **05:51:36 + 265376** Beam Permit Fail Timestamp: **05:51:36 + 265416**

Magnet / Power Supply Identity: **yi3-snk7-2.3**
3c-QPA Control / Timing Resolver: No faults indicated
Power Supply Status: = at operating current of 326 amps.
Beam Loss Monitors (rads/hr): g3-lm8 = 373, y3-lm7.2-snk = 874

Snake Quench Identified, Yellow-3c-ps1: yi3-snk7-1.4

3c-QPA Control / Timing Resolver: No faults indicated.
Power Supply Status: = Operating Current of 99.95 amps.
Qdplots: Indication of perturbation (heat transfer) taking place 2.39 seconds after yi3-snk7-2.3 quenched.

Estimated Down Time: N/A, Non Equipment Failure. Estimated Recovery Time: 96 minutes

Tech Notes / Sequence of Events:
5:51: Beam Abort, 3c-ps1 dropped {Quench - snake} Sequencer

6:12: Ha, we think we understand why we couldn't have circulating beam in yellow now. Apparent the vertical target orbit around IP4 was messed up in the model. Mei

6:15: This was my fault. I was correcting the vertical orbit after reversing the bumps in the model (design values), and forgot to change it to the trim values during vertical orbit correction. So we reverted the orbit correction values from the model and left the bumps in the model. Sanjee

6:21: We had to reduce the IP7 horizontal bump to about -8mm from -15mm to reduce the large beam losses at injection. Mei, Sanjee

MCR Notes: 06:15: yi3-snk7-2.3 and yi3-snk7-1.4 were quenched. The quenches were caused by beam loss due to large vertical beam oscillation.

6:31: I made an entry a while back, but it does not seem to be there! I shall try to remember what it was and reenter it. The rotators in the inner arcs create horizontal excursions which are radically outward. This is true for both blue and yellow beams. To counteract this we need to have horizontal bumps which pull the beam back toward the center of the ring, i.e. a negative bump. For example, the yellow beam in yo8-rot3 wiggles inward, so the compensation bump should be outward. For rotators in the outer arcs, the situation is reversed. waldo [rhic injection]

7:27: Cryo says we can turn the snake back on. waldo [yellow ps], Snake quench recovery sequence begun on snake ps 3c-ps2.12I.

7:28: Snake quench recovery sequence begun on snake ps 3c-ps2.12J.

11:42: Snake trip was caused by 3c-qd1 quench detector. The quench detector tripped because of a real quench in yi3-snk7-2.3 coil 3 inner. The beam permit tripped after the snake trip. There were beam losses at y3-lm7.2 snk. Magnet yi3-snk7-1.4 also quenched due to warm gas from the yi3-snk7-2.3 quench. There is now 2 beam induced snake quenches for this run. Ganetis [quench]

Quench Analysis: SQ Beam Induced Quench, #002

.

Thursday-April 08, 2004: SQ-008 Snake Quench Identified, Yellow 3c-ps1, File # 1081436595

Snake Permit Fail Timestamp: **11:03:12 +3305800** Beam Permit Fail Timestamp: **11:03:12 +3305840**

Magnet / Power Supply Identity: **yi3-snk7-2.3**
3c-QPA Control / Timing Resolver: No faults indicated
Power Supply Status: = at operating current of 326.95 amps.
Beam Loss Monitors (rads/hr): g3-lm8 = 368, y3-lm7.2-snk = 914

Magnet / Power Supply Identity: **yi3-snk7-1.4**
3c-QPA Control / Timing Resolver: No faults indicated.
Power Supply Status: = Operating Current of 99.92 amps.
Qdplots: Indication of perturbation (heat transfer) taking place 2.38 seconds after yi3-snk7-2.3 quenched.
Estimated Down Time: N/A, Non Equipment Failure. Estimated Recovery Time: 87 minutes

Tech Notes / Sequence of Events:
11:09: We quench the yi3-snk7-1.4 and 2.3 snakes. We wait for cryo clearance before continuing.
12:30: Cryo control reports that temperatures have stabilized and we can proceed. We will turn on the snakes and turn off the rotator magnets, since they seem to cause large orbit excursions and tune changes.
12:10: Snake trip was caused by 3c-qd1 quench detector. The quench detector tripped because of a real quench in yi3-snk7-2.3 coil 3 inner. The beam permit tripped after the snake trip. There were beam losses at y3-lm7.2 snk. Magnet yi3-snk7-1.4 also quenched due to warm gas from the yi3-snk7-2.3 quench. There is now 3 beam induced snake quenches for this run. Ganetis [quench]

Quench Analysis: SQ Beam Induced Quench, #003

Friday-April 09, 2004: PR-166, Blue Quench: File# =1081501456

Permit ID: **1b-ps1** Timestamp: **05:04:16 +178993** Beam Permit Fail Timestamp: **05:04:16, + 179023**
QPAControl / Timing Resolver: 1b-qpa, Sextupole magnets continued to run.
Quench Detector(s) Trip: (1b-qd1) B1DSA3_A2VT, Int. 100, Tq=-24
5 Minute: Quench Delay File: None initiated.
Main Magnet Power Status: At Store energy, ramp down begins and tripping at:
Blue Dipole = 1934 amps, Blue Quad = 1871 amps.
Beam Loss Monitors (Rads/Hr): Appears no beam in the machine at the time.
Postmortems / Snapshot: Postmortems show the blue main dipole power supply go into major oscillation in what appears when the switch over from Flat Top to Ramp Current occurred.
DX Heaters: None Fired.
QLI Recovery TAPE / PS On Checks Commenced: **05:25:05** Estimated Delay Time: 21 minutes

Tech Notes / Sequence of Events:
The quench link was pulled due to a quench detector at 1b-qd1 that picked up the Blue Main Dipole Power Supply that had gone into oscillation when switching from Flat Top Current to Ramp Current. There was no beam in the machine at the time, A large spike on the dipole buss seen at B1DSA_A2VT exceeded max limits. This is not a real magnet quench. Cause: Blue Main Dipole Power Supply, Oscillation. G. Heppner

5:06: We had just started to ramp down from top energy when 1b brought down the quench link. JPJ
5:10: Beam was definitely out of the machine when this QLI occurred, so it is not beam-driven. JPJ et al are consulting with cryo on recovery timescale. TJS, Ubaldo, Nick, JPJ, Vincent
10:07: blue quench link trip was caused by 1b-qd1 quench detector. The voltage signals going into the quench detector were not normal due to the blue main dipole power supply oscillating. On the down ramp the ps started to oscillate when it switch from the flat top power module to the ramp power module. Carl S. is investigating this. Ganetis [quench]

Quench Analysis: Blue Main Dipole Power Supply.

Saturday-April 10, 2004: PR-167, Yellow Quench: File# = 1081579793

Permit ID: **6b-ps1** Timestamp: **02:49:52 +1660832** Beam Permit Fail Timestamp: **02:49:52 +1660862**
QPAControl / Timing Resolver: No faults indicated, y-QD QLI YI1
Quench Detector(s) Trip: (6b-qd2) Y6QFQ3_VT, Int. 5, Tq=-24, No Auxiliary Trips.
5 Minute: Quench Delay File: **6b-qd2, Y6QFQ3_VT** (Sector 6 Triplet Region, Quad Focus, Magnet Q3)
Main Magnet Power Status: Store Energy for Polarized Proton Run, Yellow quad shows a 2 amp increase starting at –0.732 before tripping.
Beam Loss Monitors (Rads/Hr): y6-lm0 = 1815, g6-lm1 = 1641, b6-lm3.1 = 3801, y6-lm3.1 = 4602 for ½ second
Postmortems / Snapshot: Power Supplies not the cause, indications seen of current to voltage changes occurring in the triplet region at the time of beam loss.
QLI Recovery TAPE / PS On Checks Commenced: **Several attempts (5) made before #6 brought systems on.**
Estimated Delay Time: (see PR-168 for link up time.)

Tech Notes / Sequence of Events:

2:49: Beam Abort, 6b-ps1 dropped Yellow Quench Sequencer
03:15: Yellow QLI. MCR is waiting for CCR approval to recover the link.
04:00: The Yellow recovery script did not ramp the main quad supplies to 50A. Wing Louie was contacted. He is investigating from home.
04:15: Wing Louie notes that the power supply regulator for the quads failed to turn on during the QLI recovery script execution. He was able to turn on the regulator and recover the Yellow link. C. Schultheiss has been notified by Wing.
07:00: J. Kozak assumes OC duties.

11:55: Yellow quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real magnet quench at Y6QFQ3_VT. The beam permit tripped after the quench link. There was one real magnet quench at y6q3. There was high beam loss for .3 sec at y6-lm3.1 before the beam permit was tripped. Are the thresholds correct for the BLMs? There is now 45 beam induced quenches for this run. Ganetis [quench]

Quench Analysis: Beam Induced Quench, #045

Saturday-April 10, 2004: PR-168, Yellow Quench: File# = 1081583880

Permit ID: **10a-ps3.B** Timestamp: **03:58:00 +932860** Beam Permit Fail Timestamp: **03:58:00 +932889**
QPAControl / Timing Resolver: No Faults indicated, y-PM QLO-YO2, y-PM-QLO-YO1
Quench Detector(s) Trip: All main and auxiliary Systems found running.
5 Minute: Quench Delay File: None initiated.
Main Magnet Power Status: Y-Quad at zero, Y-Dipole at Park.
Main Magnet Control Page (4b-ps3): Yellow Main Quad = Reg OFF, Yellow Main Dipole = Reg ON
Postmortems / Snapshot: Nothing unusual.
Tape Message Logs: Show that the Yellow Main quad current never came up to Park Value.
QLI Recovery TAPE / PS On Checks Commenced: **04:15:14** Estimated Delay Time: 85 minutes
Checking QPSW Control: (Y9DQPSW) Open Contactor, Remote On (Y10DQPSW) Open Contactor, Remote On

Tech Notes / Sequence of Events:
3:58: Beam Abort, 10a-ps3.B dropped Yellow Quench Sequencer
3:58: Quench Link Interlock in Yellow ring, 10a-ps3.B dropped first Sequencer
12:00: Yellow quench link trip was caused by the yellow 6-KA Quench Protection Switch. The switch was turned off by the quench recovery program. The quench recovery program was re-run because the yellow main dipole p.s. did not come up to current. Carl S. should be contacted to investigate this. Ganetis [quench]
4:25: Hysteresis ramp.

Quench Analysis: Yellow Main Quad Power Supply, did not turn on during recovery.

Saturday-April 10, 2004: PR-169, Yellow Quench: File# = 1081594437

Permit ID: **8b-ps1** Timestamp: **06:53:56 +1079306** Beam Permit Fail Timestamp: **06:53:56 +1079336**
QPAControl / Timing Resolver: No faults indicated, y-QD QLI YI1
Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT, Int. 5, Tq=-24, no auxiliary trips.
5 Minute: Quench Delay File: **8b-qd2, Y8QFQ2_VT** (Sector 8 Triplet Region, Quad Focus, Magnet Q2)
Main Magnet Power Status: Ramping to Store Energy, Dipole tripping at 1922.44 amps, Quad tripping at 1867.35 amps.
Beam Loss Monitors (Rads/Hr): y8-lm0 = 1177, g8-lm1 = 2347, y8-lm3.1 = 765, all showing a rise in level starting at T-3 seconds before peak values taken.
Postmortems / Snapshot: Supplies operating as should be, entering top end of the ramp.
QLI Recovery TAPE / PS On Checks Commenced: **4 attempts made before #5 brought systems back on.**
Estimated Delay Time: (see PR-170 for link up time.)

Tech Notes / Sequence of Events:
6:51: RHIC acceleration ramp started, ramp id pp15_1081592817 Sequencer
6:54: Beam Abort, 8b-ps1 dropped Yellow Quench Sequencer

11:57: Yellow quench link trip was caused by 8b-qd1 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped after the quench link. There was one real magnet quench at y8q2. There was moderate beam loss for .5 sec at g8-lm1before the beam permit was tripped. Are the thresholds correct for the BLMs? There is now 46 beam induced quenches for this run. Ganetis [quench]

Quench Analysis: Beam Induced Quench, #046

Saturday-April 10, 2004: PR-170, Yellow Quench: File# = 1081597295

Permit ID: **10a-ps3.B** Timestamp: **07:41:32 +146012** Beam Permit Fail Timestamp: **07:41:32 +3146041**
QPAControl / Timing Resolver: No Faults indicated, y-PM QLO-YO2, y-PM-QLO-YO1
Quench Detector(s) Trip: All main and auxiliary Systems found running.
5 Minute: Quench Delay File: None initiated.
Main Magnet Power Status: Y-Quad at zero, Y-Dipole at Park.
Main Magnet Control Page (4b-ps3): Yellow Main Quad = Reg OFF, Yellow Main Dipole = Reg ON
Beam Loss Monitors (Rads/Hr): No beam in the machine.
Postmortems / Snapshot: Nothing unusual.
Tape Message Logs: Show that the Yellow Main quad current never came up to Park Value.
QLI Recovery TAPE / PS On Checks Commenced: **08:03:45** Estimated Delay Time: 70 minutes
Checking QPSW Control: (Y9DQPSW) Open Contactor, Remote On (Y10DQPSW) Open Contactor, Remote On

Tech Notes / Sequence of Events:
7:41: Quench Link Interlock in Yellow ring, 10a-ps3.B dropped first Sequencer
8:03: The first time we ran the quench recovery script, the yellow main quads did not turn on. We canceled the script and ran it again, but the script stopped when checking the quench switches. We ran it one more time, and everything came on correctly. jak, cfw

12:01: Yellow quench link trip was caused by the yellow 6-KA Quench Protection Switch. The switch was turned off by the quench recovery program. The quench recovery program was re-run because the yellow main quad p.s. did not come up to current. Carl S. should be contacted to investigate this. Ganetis [quench]

12:39: Sanjee reported in the OC log that Wing Louie was contacted around 0415 about the yellow main quad not turning on. Sanjee also reported that Wing notified Carl S. about the issue. jak
Apr 11 2004 15:13: Nobody contacted me. CS

Quench Analysis: Yellow Main Quad Power Supply, did not turn on during recovery.

Tuesday-April 13, 2004: PR-171, Yellow Quench: File# = 1081843245

Permit ID: **8b-ps1** Timestamp: **04:00:44 +1574163** Beam Permit Fail Timestamp: **04:00:44 +1574193**
QPAControl / Timing Resolver: No Faults listed, y-QD QLI- I1
Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT, Int. 5, Tq=-24, No auxiliary trips.
5 Minute: Quench Delay File: Did not register the file.
Main Magnet Power Status: Ramping to Store, Dipole tripped at 1943.53 amps, Quad tripped at 1887.81 amps.
Beam Loss Monitors (Rads/Hr): High losses at y8-lm0 = 2092, g8-lm1 = 10 second data window displays steady increase with a peak value of 3969 at –0.5 seconds to T=zero, y8-lm3.1 = an average value of 150 for the duration peak valuing at 349.
Postmortems / Snapshot: Noting to indicate that a power supply caused the event. Yo8-qd1, qf2 and qd3 all show voltage to current change as would be indicated with a beam induction.
QLI Recovery TAPE / PS On Checks Commenced: **4 attempts made before bring Yellow Link Back to Life.**

TAPE Recovery:

1) Timestamp: Tue Apr 13 04:35:35 2004, ran up to step #26 wfg.y-qmain-ps readbackM[1] current = 0.00195313 (04:37:48) User invoked cancel
2) Timestamp: Tue Apr 13 04:37:51 2004, Num ADO Name - Control
1 occCtrl.y-qmain On (0 out of 1 main supplies could NOT have PS state set to On.
Done with Set of PS Mains.)
3) Timestamp: Tue Apr 13 04:38:11 2004

Num	Device	Property	Value
1	wfg.y-qmain-ps	readbackM[1]	0.000976563
2	wfg.y-qmain-ps	readbackM[1]	0.00195313
3	wfg.y-qmain-ps	readbackM[1]	0.00195313
4	wfg.y-qmain-ps	readbackM[1]	0.000976563

At 04:38:36, User invoked cancel.
4) Timestamp: Tue Apr 13 05:27:47 2004, Link Recovered. Estimated Time to Recovery Link**:** 88 minutes

Tech Notes / Sequence of Events: Even though there was no file stored for this event in the QD Real Quench page, Qdplots definitely shows that Y8QFQ2_VT had in fact quenched. This signal monitors the Yellow, Quad Focus Q2 Magnet of the triplet region in Sector 8. There had been enough beam loss in the sector 8 Triplet to cause this magnet to quench (see Beam Loss Monitors above), pulling the 8b-qd2 Quench Detector. In addition, the recovery of the Quench Link was prolonged due to the Yellow Main Quad Power Supply not turning ON during the recovery (TAPE) Script. G. Heppner

Physics Log: 3:58: RHIC acceleration ramp started, ramp id pp15_1081842812 Sequencer
4:00: Quench Link Interlock in Yellow ring, 8b-ps1 dropped first Sequencer
4:00: Beam Abort, 8b-ps1 dropped Yellow Quench Sequencer
4:02: Dumping Beam and ramping down Sequencer
4:40: Problems with quench recovery - yellow main quad does not come up. fp nak
4:45: Vincent called Carl Schultheiss to investigate. He will check it out and call us back. JPJ, VHS
5:39: The PLC program for the YQ was corrupted. I checked the program and reloaded it. CS
12:11: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped after the quench link. There was one real quench at y8q2. There was low to moderate beam losses at g8-lm.1. There is now 47 beam induced quenches for this run. Ganetis [quench]

MCR Log: 04:00: Setup is off. BLIP is running. A Yellow quench link interlock occurred just as the magnets were reaching flattop current. Quench detector Y8QFQ2_VT pulled the permit. The AGS A20 current transformer failsafe interlock test was performed successfully.
04:20: The Post Mortem Server stopped running after the QLI and was restarted.
04:30: Quench recovery failed to complete when the contactor for the Yellow Main Quad Flattop power supply did not close. We will try the failed step again.
04:38: C. Schultheiss is investigating the y-qmain problem from home.
05:30: Machine Setup. Carl found that the PLC software for the y-qmain power supply had been corrupted. He was able to reload the software.

Quench Analysis: Beam Induced Quench, #047

Tuesday-April 13, 2004: **PR-172, Yellow Quench: File# =** 1081866246

Permit ID: **8b-ps1** Timestamp: **10:24:04 +2854662** Beam Permit Fail Timestamp**: 10:24:04 +2854692**
QPAControl / Timing Resolver: No Faults listed, y-QD QLI- I1
Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT, Int. 5, Tq=-24, No auxiliary trips.
5 Minute: Quench Delay File: 8b-qd2, Y8QFQ2_VT
Main Magnet Power Status: Main approaching Store Energy, tripping at Dipole = 1932 amps, Quad = 1876 amps.
Beam Loss Monitors (Rads/Hr): Beam intensity begins to increase approximately 7 seconds before reaching peak values of: y8-lm0 = 670, g8-lm1 = 1342
Postmortems / Snapshot: Noting to indicate that a power supply caused the event. Yo8-qd1, qf2 and qd3 all show voltage to current change as would be indicated with a beam induction.
QLI Recovery TAPE / PS On Checks Commenced: **10:46:43** Estimated Time to Recovery Link: 22 minutes

Tech Notes / Sequence of Events: The Yellow Quench Detector tripped indicating Y8QFQ2_VT. This signal monitors the Yellow, Quad Focus Q2 Magnet of the triplet region in Sector 8. There had been enough beam loss in the sector 8 Triplet to cause this magnet to quench (see Beam Loss Monitors above), pulling the 8b-qd2 Quench Detector. This will raise the Beam Induced Counter to #048. G. Heppner

10:21: RHIC acceleration ramp started, ramp id pp15_1081865824 Sequencer
10:24: Beam Abort, 8b-ps1 dropped Yellow Quench Sequencer
10:24: Quench Link Interlock in Yellow ring, 8b-ps1 dropped first Sequencer
10:27: Quench was probably caused by Yellow beam approaching the 0.75 resonance. Wolfram
12:09: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped after the quench link. There was one real quench at y8q2. There was low to moderate beam losses at g8-lm.1. There is now 48 beam induced quenches for this run. Ganetis [quench]

Quench Analysis: Beam Induced Quench, #048

Tuesday-April 13, 2004: **PR-173, Yellow Quench: File# = 1081871315**

Permit ID: **8b-ps1** Timestamp: **11:48:32 +3707486** Beam Permit Fail Timestamp**: 11:48:32 +3707516**
QPAControl / Timing Resolver: No Faults listed, y-QD QLI- I1
Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT, Int. 5, Tq=-24, No auxiliary trips.
5 Minute: Quench Delay File: 8b-qd2, Y8QFQ2_VT
Main Magnet Power Status: Main approaching Store Energy, tripping at Dipole = 1935.53 amps, Quad = 1879.33 amps.
Beam Loss Monitors (Rads/Hr): Beam intensity begins to increase approximately 7 seconds before reaching peak values of: y8-lm0 = 441, g8-lm1 = 883
Postmortems / Snapshot: Noting to indicate that a power supply caused the event. Yo8-qd1, qf2 and qd3 all show voltage to current change as would be indicated with a beam induction.
QLI Recovery TAPE / PS On Checks Commenced: **10:46:43** Estimated Time to Recovery Link: 22 minutes

Tech Notes / Sequence of Events: : The Yellow Quench Detector tripped indicating Y8QFQ2_VT. This signal monitors the Yellow, Quad Focus Q2 Magnet of the triplet region in Sector 8. There had been enough beam loss in the sector 8 Triplet to cause this magnet to quench (see Beam Loss Monitors above), pulling the 8b-qd2 Quench Detector. This will raise the Beam Induced Counter to #049. G. Heppner

11:41: Artus should work now along the whole ramp. Some adjustments were made by Angelike to cope with the higher bunch intensity. Wolfram
11:46: RHIC acceleration ramp started, ramp id pp15_1081871154 Sequencer
11:50: Quenched Yellow again. Wolfram
12:09: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped after the quench link. There was one real quench at y8q2.. There was low to moderate beam losses at g8-lm.1. There is now 49 beam induced quenches for this run. This is the third beam loss quench in the last 12 hours. What are the thresholds for the blms for the triplets? Are they too high? Ganetis [quench]

Quench Analysis: Beam Induced Quench, #049

Wednesday-April 14, 2004: **PR-174, Yellow Quench: File# = 1081925680**
Permit ID: **4b-time.B, Yellow Main PS** Timestamp: **02:54:40 + 98700** Beam Permit Fail Timestamp**:** **02:54:40 + 98731**
QPAControl / Timing Resolver: No Faults listed, y-PM QLO-YO2, y-PM-QLO-YO1
Quench Detector(s) Trip: Main and Auxiliary systems running.
5 Minute: Quench Delay File: All Systems remained in running status.
Main Magnet Power Status: At zero currents
Main Magnet Control (4b-ps3): Reg OFF, Auto OFF, Main Contactor Open, Quench I...
PS Gnd Curr Trip, Reg Temp, Reg PLL, Reg Watchdo...
Field Power Off
Under Range - ColdBox Temp, Under Range - ColdBo...

Beam Loss Monitors (Rads/Hr): No Affect, beam dumped.
Postmortems / Snapshot: All supplies had been ramped to zero current.

QLI Recovery TAPE / PS On Checks Commenced: **04:05:17** Estimated Time to Recovery Link: 71minutes

Tech Notes / Sequence of Events: (Summary from Physics Log) 1.We had again the problem with Yellow main field power supply regulation. Carl came in and fixed this again. 2. We still had to change radial orbit in Yellow with local bumps in order to provide acceptable energy matching at the injection. 3. Ramp with 56 bunches (0.4-0.5e11 per bunch). Polarization measurements: Blue: 42% (injection), 25% (store) Yellow: 0% both at the injection and the store. Vadim, Yun

01:50: C. Schultheiss was contacted to investigate a possible Yellow Main Dipole power supply regulation error that may be the cause of a Yellow beam Energy Matching problem.
02:10: Setup is off. Carl is coming in to check the DCCT for the y-dmain power supply. The RHIC magnets are being ramped down to zero.
04:09: Carl and Rich (from CAS) swapped out the y-dmain DCCT electronics and tightened the head connectors. The RHIC magnets are ramping back to injection.
04:18: Machine Setup. 06:00: Carl is leaving.

C. Schultheiss was contacted after the Yellow beam energy matching at injection was found to gradually be getting worse since sometime during the day on Tuesday. Carl found that the y-dmain DCCT reading has been dropping gradually over the last few ramps. He and R. Difranco swapped out the DCCT electronics and tightened the head connectors on the DCCT. The DCCT reading is now back to where it was before any abnormal activity was observed this week (Monday @ 18:00).

History Re-cap from April 13 Physics Log:
15:35: Carl seems some discrepancy in the Yellow DCCT since about 12:30 today. We will bring the ring to zero and he will restart certain things. Johannes, Andy, Wolfram
15:45: Carl has restarted the Yellow dipole current Regulator, we will do a hysteresis ramp now. Wolfram
16:01: Orders from Carl are to use beam as a diagnostic. Now being held off by access control problems in AGS/Booster. ADM

Quench Analysis: Yellow Main Dipole Power Supply

Wednesday-April 14, 2004: **PR-175, Blue Quench: File# = 1081926822**
Permit ID: **4b-time.B, Blue Main PS** Timestamp: **03:13:40 +2234395**
Beam Permit Fail Timestamp**:** **02:54:40 + 98731** (Down from previous Quench PR-174 Yellow Main Dipole)
QPAControl / Timing Resolver: No Faults listed, b-PM QLO - BO2, b-PM-QLO - BO1
Quench Detector(s) Trip: Main and Auxiliary systems running.
5 Minute: Quench Delay File: All Systems remained in running status.
Main Magnet Power Status: At zero currents
Main Magnet Control (4b-ps3): Blue Main Dipole: Reg DCCT

Beam Loss Monitors (Rads/Hr): No Affect, beam dumped.
Postmortems / Snapshot: All supplies had been ramped to zero current.

QLI Recovery TAPE / PS On Checks Commenced: **03:55:22** Estimated Time to Recovery Link: 42minutes

Tech Notes / Sequence of Events:

3:13: Quench Link Interlock in Blue ring, 4b-time.B dropped first Sequencer
3:45: Blue quench recovery sequence begun tape

While solving the Yellow Main Dipole, Blue was pulled. 11:38: Working on MPS. CS

Quench Analysis: Blue Main Dipole Power Supply

Wednesday-April 14, 2004: **PR-176, Yellow Quench: File# = 1081960830**
Permit ID: **5b-ps1** Timestamp: **12:40:28 +2542837** Beam Permit Fail Timestamp**: 12:40:28 + 2542868**
QPAControl / Timing Resolver: Sextupoles remained running.

Quench Detector(s) Trip: (1b-qd1) Yellow Quenched Y12DSA5_A4VT Int. 1, Tq=-23
(2b-qd2) Yellow Quenched Y1DSD9_5VT Int. 1, Tq=-11
(3b-qd1) Yellow Quenched Y2DSA5_A4VT Int. 1, Tq=-12
(4b-qd2) Yellow Quenched Y3DSD9_5VT Int. 1, Tq=-23
(5b-qd1) Yellow Quenched Y4DSA5_A4VT Int. 1, Tq=-24
(6b-qd2) Yellow Quenched Y5DSD9_5VT Int. 1, Tq=-11
(7b-qd1) Yellow Quenched Y6DSA5_A4VT Int. 1, Tq=-23
(8b-qd2) Yellow Quenched Y7DSD9_5VT Int. 1, Tq=-23
(9b-qd1) Yellow Quenched Y8DSA5_A4VT Int. 1, Tq=-11
(10a-qd2) Yellow Quenched Y9DSD9_5VT Int. 1, Tq=-24
(11b-qd1) Yellow Quenched Y10DSA5_A4VT Int. 1, Tq=-11
(12a-qd2) Yellow Quenched Y11DSD9_5VT Int. 1, Tq=-23
(12a-qd2) Yellow Quenched Y11DSD9_5VT Int. 1, Tq=-23

5 Minute: Quench Delay File: Yellow Detectors recorded but none initiated.
Main Magnet Power Status: Running at Store Current of 1946.76 amps when several spike occur as seen on Qdplots starting at –1.51 seconds referenced to T=zero before current drops off at -0.033seconds before T=zero
Main Magnet Control (4b-ps3): y-dmain-ps = Reg DCCT

Beam Loss Monitors (Rads/Hr): Normal Operation
Postmortems / Snapshot: 1004B shows the Yellow Dipole Main Voltage initially shot up approximately 40 volts, current begins to drop off all before T = zero.

QLI Recovery TAPE / PS On Checks Commenced: **18:20:50**
Estimated Time to Recovery Link: 340 minutes (Note: Power Failure in the 1004B substation prolonged this recovery)

Tech Notes / Sequence of Events:

12:16: Will dump Yellow soon. Waiting for phone call from STAR (their DAQ is on). Haixin
12:18: Yellow is dumped and jet people are using blue beam. Todd is timing in the DX BPMs for blue only. Haixin,Rogelio

12:40: Beam Abort, 5b-ps1 dropped Yellow Quench Sequencer
12:51: Jet folks were just out of the tunnel. Don Bruno is investigating. There are many voltage tap errors all around the yellow ring that were associated with this quench, but we had only blue beam in the machine at the time. TJS

12:40: Quench Link Interlock in Yellow ring, 5b-ps1 dropped first Sequencer
13:03: I could be wrong but I think the yellow dipole main caused the yellow link to trip. I will put a picture in the e-log later on since I don't know how to attach it here. I will also call Carl so he can confirm this for me. Don Bruno [rhic ps]

12:42: Dumping Beam and ramping down Sequencer
13:20: There also was a "Reg DCCT" fault on the yellow main dipole p.s. Carl is having Fred Orsatti change a connector on the yellow main dipole DCCT cable. It will take 1 to 2 hours Don Bruno [rhic ps]

13:25: DCCT connector will be replaced and it may take more than one hour. Haixin

Quench Analysis: Yellow Main Dipole Power Supply, DCCT Reg.

Wednesday-April 14, 2004: **PR-177, Blue Quench: File# = 1081966803**
Permit ID: 4b-time.A Timestamp: 14:20:00 +3125702 Beam Permit Fail Timestamp**:** 12:40:28 +2542867
QPAControl / Timing Resolver: b-BP QLI - BI4, b-qpa QP09-R4BBQF5-bo3-qd7-qp
Quench Detector(s) Trip: (4b-qd1), Blue Quenched B4DRDX_VT Int. 1, 14:20:53 [rhicMode: AUAU1] Tq = 17558, only one that tripped.
5 Minute: Quench Delay File: N/A
Main Magnet Power Status: Zero Currents
Main Magnet Control (4b-ps3): N/A
Beam Loss Monitors (Rads/Hr): No beam at the time.
Postmortems / Snapshot: N/A

QLI Recovery TAPE / PS On Checks Commenced: **18:04:51**
Estimated Time to Recovery Link: 322 minutes (due to Power Failure)

Tech Notes / Sequence of Events:
While working on the Yellow Dipole (PR-176) the Blue Link came down. Power Failure at 1004B Substation, 480vac, Phase A and Phase C shorted somewhere in the tube underground. Q-Trim supplies affected, loss of AC Power. With double cables per phase, Electricians where able to split the lines and supply the panel affected with one cable per phase (half the rating) but this was okayed by the Lead Official. Note: Polarized Proton runs at half the energy as Gold to Gold.

16:17: T. Nehring reports that power supply personnel will be attempting to energize a secondary feeder cable into 1004B in order to restore power to the building.

16:38: P. Feng reports that power has been restored to the 1004B building. We prepare to restore RHIC to operation.

19:22: There was a power failure at 1004B today at 14:17. Don Bruno [rhic ps]

19:29: Gregg Heppner completed a hysteresis ramp with the RHIC power supplies and they all look ok. We left the snake and rotator power supplies at 1 amp. We did not ramp the snake power supplies up to operating current. Gregg also swapped out the current regulator for b8-q89-ps. We checked it on Barshow and it looks ok. Don Bruno [rhic ps]

Quench Analysis: Power Failure, 1004B Substation.

Wednesday-April 14, 2004: **SQ-009 Snake Quench Identified, 3C, File# 1081960830**
Snake Permit Fail Timestamp: **zero date** Beam Permit Fail Timestamp: **12:40:28 +2542864**

Power Supply **yi3-snk7-2.3** Status: = Operating Current of 326 amps.
Power Supply **yi3-snk7-1.4** Status: = Operating Current of 100 amps.
Power Supply **bo3-snk7-2.3** Status: = Operating Current of 326 amps.
Power Supply **bo3-snk7-1.4** Status: = Operating Current of 100 amps.

Quench Status: **Real Magnet Quenches.** Magnets running at Store Energy Currents, Cryo required to be notified.

Wednesday-April 14, 2004: **SQ-009 Rotator Quench Identified, 5C, File# 1081960830**
Snake Permit Fail Timestamp: **zero date** Beam Permit Fail Timestamp: **12:40:28 +2542833**

Power Supply **yo5-rot3-2.3** Status: = Zero Current.
Power Supply **yo5-rot3-1.4** Status: = Zero Current.
Power Supply **bi5-rot3-2.3** Status: = Zero Current.
Power Supply **bi5-rot3-1.4** Status: = Zero Current.

Quench Status: Not a real magnet quench, running at zero currents.

Wednesday-April 14, 2004: **SQ-009 Rotator Quench Identified, 7A, File# 1081960830**
Snake Permit Fail Timestamp: **zero date** Beam Permit Fail Timestamp: **12:40:28 +2542841**

Power Supply **yi6-rot3-2.3** Status: = Zero Current.
Power Supply **yi6-rot3-1.4** Status: = Zero Current.
Power Supply **bo6-rot3-2.3** Status: = Zero Current.
Power Supply **bo6-rot3-1.4** Status: = Zero Current.

Quench Status: Not a real magnet quench, running at zero currents.

Wednesday-April 14, 2004: **SQ-009 Rotator Quench Identified, 7C, File# 1081960830**
Snake Permit Fail Timestamp: **zero date** Beam Permit Fail Timestamp: **12:40:28 +2542835**

Power Supply **yi7-rot3-2.3** Status: = Zero Current.
Power Supply **yi7-rot3-1.4** Status: = Zero Current.
Power Supply **bo7-rot3-2.3** Status: = Zero Current.
Power Supply **bo7-rot3-1.4** Status: = Zero Current.

Quench Status: Not a real magnet quench, running at zero currents.

Wednesday-April 14, 2004: **SQ-009 Rotator Quench Identified, 9A, File# 1081960830**
Snake Permit Fail Timestamp: **zero date** Beam Permit Fail Timestamp: **12:40:28 +2542837**

Power Supply **yo8-rot3-2.3** Status: = Zero Current.
Power Supply **yo8-rot3-1.4** Status: = Zero Current.
Power Supply **bi8-rot3-2.3** Status: = Zero Current.
Power Supply **bi8-rot3-1.4** Status: = Zero Current.

Quench Status: Not a real magnet quench, running at zero currents.

Wednesday-April 14, 2004: SQ-009 Snake Quench Identified, 9C, File# 1081960830

Snake Permit Fail Timestamp: **zero date** Beam Permit Fail Timestamp: **12:40:28 +2542837**

Power Supply **yo9-snk7-2.3** Status: = Operating Current of 326 amps.
Power Supply **yo9-snk7-1.4** Status: = Operating Current of 100 amps.
Power Supply **bi9-snk7-2.3** Status: = Operating Current of 326 amps.
Power Supply **bi9-snk7-1.4** Status: = Operating Current of 100 amps.

Quench Status: **Real Magnet Quenches.** Magnets running at Store Energy Currents, Cryo required to be notified.

Tech Notes / Sequence of Events:
Qdplots: No Files found due to System Off Line.

Estimated Down Time: N/A Estimated Recovery Time: N/A minutes

14:20: Quench Link Interlock in Blue ring, 4b-time.A dropped first Sequencer
15:08: Cryo asked to turn off snakes since they already quenched. We could not do it since 1004B ac power down and no event trigger at all. Haixin, Waldo

19:22: There was a power failure at 1004B today at 14:17. The snake magnets quenched at 14:36 because the UPS at 1004B, which keeps the event link up ran out of battery power. When the event link goes down the setpoint drops to zero very quickly and the snake magnets quench if they are above 20A. We had 19 minutes to ramp down the snake power supplies if we would have had an alarm from the UPS that keeps the event link up. The alarm would tell us that the batteries in the UPS have started delivering power. We think it would be very good to get an alarm to the alarm screen from this UPS so we know we know that the event link will go down in 19 minutes and we can ramp the snakes down before the event link goes away. Don Bruno [rhic ps]

Quench Analysis: Permit Fail, 720Hz due to Power Failure, UPS ran out of Battery Time.

Wednesday-April 14, 2004: PR-178, Yellow Quench: File# = 1081986419

Permit ID: 4b-time.B, Yellow Main PS Timestamp: 19:46:56 +3023775
Beam Permit Fail Timestamp**:** Still down from Power Failure.
QPAControl / Timing Resolver: N/A
Quench Detector(s) Trip: N/A
5 Minute: Quench Delay File: All Systems running.
Main Magnet Power Status: Zero currents.
Main Magnet Control (4b-ps3): y-dmain-ps = Reg DCCT
Beam Loss Monitors (Rads/Hr): No Beam in the machine.
Postmortems / Snapshot: N/A

QLI Recovery TAPE / PS On Checks Commenced: **20:14:32** Estimated Time to Recovery Link: 28 minutes

Tech Notes / Sequence of Events: COUNTRERS: Maintenance for the Main Yellow Dipole.
After a Hysteresis Ramp was completed, Carl needed more time to fix the DCCT.
19:46: Quench Link Interlock in Yellow ring, 4b-time.B dropped first Sequencer
19:49: Carl switched over to regulate off of the redundant DCCT for the yellow dipole main p.s.'s. He said there is a problem with it. He will go back to the original DCCT but he has installed new connectors for it and will install a new electronics module for it. Don Bruno [rhic ps]
20:04: Yellow quench recovery sequence begun tape

Quench Analysis: Yellow Main Dipole Power Supply, DCCT Problems.

Wednesday-April 14, 2004: **PR-179, Yellow Quench: File# = 1081988380**
Permit ID: 4b-time.B, Yellow Main PS Timestamp: 20:19:36 +3928650 Beam Permit Fail Timestamp**:** Still down from Power Failure.
QPAControl / Timing Resolver: N/A
Quench Detector(s) Trip: N/A
5 Minute: Quench Delay File: Systems Running
Main Magnet Power Status: Zero Currents
Main Magnet Control (4b-ps3): y-dmain-ps = Reg DCCT

Beam Loss Monitors (Rads/Hr): No Beam in the machine.
Postmortems / Snapshot: N/A

QLI Recovery TAPE / PS On Checks Commenced: **21:32:14**
Estimated Time to Recovery Link: 73 minutes

Work Continues:

----- Checking PS All -----
| y-dmain-ps | Reg OFF, Auto OFF, Main Contactor Open, Quench Indication, SCR Gate Drive OFF | Reg Temp, Reg PLL, Reg Watchdog, Reg Pwr Sply
| y-qmain-ps | Reg ON, Auto ON, Main Contactor Open, Quench Indication, SCR Gate Drive OFF |

Tech Notes / Sequence of Events:
COUNTRERS: Maintenance for the Main Yellow Dipole.

21:01: C. Schultheiss indicates that he has run into complications in attempting to replace the faulty DCCT in the yellow ring. He is estimating another half hour to correct these problems and complete the replacement.
21:28: C. Schultheiss indicates that the replacement work on the DCCT is complete. He is restoring the link for the yellow ring. He will then conduct a final check on the DCCT, and allow us to proceed with operations.
21:37: C. Schultheiss indicates that the repairs are complete and a check of the DCCT shows that it is working properly. We ramp for hysteresis.

21:53: Dropped the link to restore the DCCT's. The Holec unit was showing a lot of noise (100 mA pk to pk at 80 Hz). The regulator is now using a third Danfysik electronics unit. The redundant DCCT read back is not working properly, it will be fixed at the next maintenance day. CS

April 15, 2004: Further investigation of the original DCCT Burndy Connector from the DCCT Module at the DC Buss that was replaced showed that female "Pin - D" had no longer spring tension to secure the mating pin. F. Orsatti

Quench Analysis: Yellow Main Dipole Power Supply, DCCT Problems.

Friday-April 16, 2004: PR-180, Blue Quench: File# = 1082138482

Permit ID: **8b-ps1** Timestamp: **14:01:20 + 2114844** Beam Permit Fail Timestamp: **14:01:20 + 1998616**
QPAControl / Timing Resolver: No Faults listed, b-QD QLI BI1
Quench Detector(s) Trip: (8b-qd1) Blue Quenched at B7QFQ2_VT, Int. 5, Tq = -24
5 Minute: Quench Delay File: 8b-qd1, B7QFQ2_VT (Blue, Sector 8 Triplet, Q2 magnet)
Main Magnet Power Status: Sitting at Store Energy.
Main Magnet Control (4b-ps3): Proper Reaction.
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): Start of 3 second increase before reaching peak values of: b7-lm3.1 = 153.11, g7-lm1 = 4132.87, b7-lm0 = 999.26
Postmortems / Snapshot: Power Supplies not responsible for the Quench, bo7, qd1, qf2 and qd3 all show signs of Beam induction.
QLI Recovery TAPE / PS On Checks Commenced: **14:32:23** Estimated Time to Recovery Link: 32 minutes

Tech Notes / Sequence of Events:

Quench Detector 8b-qd1 sensed a real magnet Quench at B7QFQ2_VT, therefore tripping the Blue Link. High Beam losses present for 3 seconds caused Quad Focus Magnet, b7q2 of Sector 7 Blue Triplet Region to Quench. The Beam Permit tripped 0.116 seconds before the Quench Link. G. Heppner

14:13: Attempt to optimize PHENIX, the applied bump was clearly running away, we were steering on background and I stopped the 'optimization'. Since it went up to +4 mm in horizontal I tried to go back using IR steering, shown in the right picture (where blue depicts a +4mm bump in horizontal). Applying a bump request of -3 or -1 mm resulted in an error message that maximum strength was exceeded in bo7-th4. Applying a -0.5 mm bump quenched the blue PHENIX sec 7 triplet(?!?).The wrong bump is still in PHENIX and needs to be taken out. ad

19:39: Blue quench link trip was caused by 8b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B7QFQ2_VT. The beam permit tripped .116 sec. before the quench link. There was one real magnet quench at b7q2. There was moderate beam loss for 1.5 sec at g7-lm1before the beam permit was tripped. There is now 50 beam induced quenches for this run. Ganetis [quench]

Quench Analysis: Beam Induced Quench #050

Friday-April 16, 2004: PR-181, Yellow Quench: File# = 1082139329

Permit ID: **5b-ps1** Timestamp: **14:15:28 + 1689975** Beam Permit Fail Timestamp: **14:01:20 + 1998611**
QPAControl / Timing Resolver:
Quench Detector(s) Trip: 5b-qd1 Main & Auxiliary in the Pink (Re-booted)
5 Minute: Quench Delay File: None
Main Magnet Power Status: At Zero Current.
Main Magnet Control (4b-ps3): Proper Reaction.
Beam Loss Monitors (Rads/Hr): No Beam in the Machine.
Postmortems / Snapshot: Supplies ramped to zero currents including the 5B Blue and Yellow Sextupoles.
QLI Recovery TAPE / PS On Checks Commenced: **14:52:12** Estimated Time to Recovery Link: 51minutes

Tech Notes / Sequence of Events:
Alarm Log had indicated failure of cfe-5b-qd1
FitReader verified that a Reset had taken place at 14:15:29. This will pull the Link. However, the good news is that this occurred right after the Blue Ring Quenched (Reference to PR-101), the Yellow Ring magnets had been ramped to zero prior to this Reset. G. Heppner

15:27: This dropped when we reset cfe-5b-qd1. Peggy

Quench Analysis: Quench Detector Fault, Reset of cfe-5b-qd1.

Saturday-April 17, 2004: **PR-182, Blue Quench: File# =** 1082181753

Permit ID: **10a-ps3.A** Timestamp: **02:02:32 +1039972** Beam Permit Fail Timestamp**: 23:58:28 +3559482**
Quench Detector(s) Trip: 4b-qd1 & 10a-qd1 in the Pink (reset)
5 Minute: Quench Delay File: None initiated.
Main Magnet Power Status:

DX Heaters: (10a-ps3.A1) Off - cfe-10a-ps3
(10a-ps3.A2) Off - cfe-10a-ps3
(10a-ps3.B1) Off - cfe-10a-ps3
(10a-ps3.B2) Off - cfe-10a-ps3

QLI Recovery TAPE / PS On Checks Commenced: **02:39:43** Estimated Time to Recovery Link: 162 minutes

Tech Notes / Sequence of Events:

Three Attempts to the TAPE Program had been made before a successful recovery:
2:13: Blue quench recovery sequence begun tape
2:15: Blue quench recovery sequence begun tape
2:28: Blue quench recovery sequence begun tape

3:39: We had to reset cfe-10a-qd1, qd2, 2b-qd1, and 4b-qd1 (and someone else probably reset 4b-qd2) after the first hysteresis ramp. George Ganetis and Al Marusic were contacted. JPJ, NAK (Numerous FEC no heartbeat alarms were received during this period.)
3:45: The PHENIX and STAR access went longer than was planned due to PHENIX detector problems and a Cryo 6Q3 PLC problem. Nils Danielson came in and reseated the modules in 6Q3 to clear the problem. While PHENIX was still in the tunnel, we did a hysteresis ramp. At the end of the ramp, we encountered the QD FEC problems mentioned below. JPJ

Quench Analysis: Reset of Quench Detector Required.

Saturday-April 17, 2004: **PR-183, Yellow Quench: File# =** 1082182089

Permit ID: **10a-ps3.A** Timestamp: 02:08:08 +1276274 Beam Permit Fail Timestamp**: Already Down.**
Quench Detector(s) Trip: 10a-qd2 in the Pink (Reset)
5 Minute: Quench Delay File: None initiated.
Main Magnet Power Status:

DX Heaters: Indicated under this yellow file, not under the blue:
(4b-ps4.A1) Off - cfe-4b-ps4
(4b-ps4.A2) Off - cfe-4b-ps4
(4b-ps4.B1) Off - cfe-4b-ps4
(4b-ps4.B2) Off - cfe-4b-ps4

QLI Recovery TAPE / PS On Checks Commenced: **02:49:39** Estimated Time to Recovery Link: 172 minutes

Tech Notes / Sequence of Events:
2:40: Yellow quench recovery sequence begun tape
3:39: We had to reset cfe-10a-qd1, qd2, 2b-qd1, and 4b-qd1 (and someone else probably reset 4b-qd2) after the first hysteresis ramp. George Ganetis and Al Marusic were contacted. JPJ, NAK (Numerous FEC no heartbeat alarms were received during this period.)
3:45: The PHENIX and STAR access went longer than was planned due to PHENIX detector problems and a Cryo 6Q3 PLC problem. Nils Danielson came in and reseated the modules in 6Q3 to clear the problem. While PHENIX was still in the tunnel, we did a hysteresis ramp. At the end of the ramp, we encountered the QD FEC problems mentioned below. JPJ

Quench Analysis: Reset of Quench Detector Required.

Sunday-April 18, 2004: PR-184, Yellow Quench: File# = 1082302675

Permit ID: **11b-ps1** Timestamp: **11:37:52 +3575863** Beam Permit Fail Timestamp**: 11:37:52 +3575892**
QPAControl / Timing Resolver:
Quench Detector(s) Trip: (2b-qd2) Yellow Quenched Y1QFQ2_VT Int. 1, Tq=-12
(7b-qd1) Yellow Quenched Y6QDA3_A2VT Int. 1, Tq=-23
(10a-qd2) Yellow Quenched Y9QFQ2_VT Int. 1, Tq=-13
(11b-qd1) Yellow Quenched Y10QDA3_A2VT Int. 1, Tq=-23
(12a-qd2) Yellow Quenched Y11QFQ2_VT Int. 1, Tq=-24

5 Minute: Quench Delay File: None Initiated.
Main Magnet Power Status: Ramping down from Store Energy, Dipole tripped at 1318.54 amps.
Qdplots show the Main Quad as it is ramping down at 1280.08amps suddenly jumps to 1285.40 amps then trips.

Main Magnet Control (4b-ps3): Dipole: Reg ON, Auto ON, Main Contactor Open, Quench Ind...
Quad: Reg ON, Auto OFF, Main Contactor Open, Quench In...
Beam Loss Monitors (Rads/Hr):
Postmortems / Snapshot: 1004B for the Yellow Main Quad, indicates that there was a 64amp drop in the Iref while ramping down. The Error Signal responded so it is believed that this spike was real. Right after that, there is a voltage drop of approximately 20 volts and at the same time the wfg Input M increases. All this begins to take place at –0.04 seconds before T=zero.

QLI Recovery TAPE / PS On Checks Commenced: **12:42:11** Estimated Time to Recovery Link: 65 minutes

Tech Notes / Sequence of Events:
11:38: Quench Link Interlock in Yellow ring, 11b-ps1 dropped first Sequencer
11:42: Several voltage taps around the ring have alarmed (10a, 7b, 12a, 11b, 2b), and this occurred while we were ramping down, so no beam was in the machine. This is a typical signature of a yellow main problem. Libby is contacting Carl Schultheiss to investigate, and we're ramping other mains back down to zero. TJS, Sanjee, AJK, Libby

12:27: After some tag back and forth (my communication fault), Carl is resetting the regulator and we'll recover. He agrees that it sounds like the problem was in the y-qmain but isn't sure whether it's a timing problem or a controls setpoint problem. TJS

12:32: Yellow quench recovery sequence begun tape

12:38: From bad to worse: minor power dip, yellow abort kicker tripped, AGS MMPS tripped, ATR magnets tripped, etc. TJS

12:41: Main magnets for both PHENIX and STAR also tripped. Support is assisting with restoration. TJS

12:59: Back up after power dip; STAR magnets appear to be up, PHENIX central inner magnet is ramping and central outer magnet is still off. TJS

19:26: Yellow quench link trip was caused by 11b-qd1 quench detector. The quench detector tripped because of a erroneous current signal from the yellow main quad power supply. ganetis [quench]

Quench Analysis: Yellow Main Quad Power Supply.

Sunday-April 18, 2004: **PR-185, Yellow Quench: File# = 1082315351**
Permit ID: **12a-ps1.A** Timestamp: **15:09:08 +3853950** Beam Permit Fail Timestamp**:** **15:09:08 +3853979**
QPAControl / Timing Resolver: y-QD QLI YI1
Quench Detector(s) Trip: (12a-qd2) Yellow Quenched Y12QFQ7_VT Int. 1, Tq=-24

5 Minute: Quench Delay File: (1b-qd1) Y1QDA4_A5VT and Y12QDA6_A7VT
(2b-qd2) Y1QFQ7_VT
(5b-qd1) Y5QDA4_A5VT and Y4QDA6_A7VT
(6b-qd2) Y5QFQ2_VT
(12a-qd2) Y12QFQ7_VT

Main Magnet Power Status: Supplies tripping at the following: Main Dipole = 1945.75, Main Quad = 1871.65.

Main Magnet Control (4b-ps3): Dipole: Reg ON, Auto ON, Main Contactor Open, Quench Ind...
Quad: Reg ON, Auto ON, Main Contactor Open, Quench Ind...
Beam Loss Monitors (Rads/Hr): Multiple Losses throughout the Ring!
Postmortems / Snapshot: N/A

QLI Recovery TAPE / PS On Checks Commenced: **15:44:20** Estimated Time to Recovery Link: 35 minutes

Tech Notes / Sequence of Events:

15:09: Dumping Beam and ramping down Sequencer
15:09: Quench Link Interlock in Yellow ring, 12a-ps1.A dropped first Sequencer

15:20: This occurred just after the sequencer started the Dump sequence by Tony. There is no BLM postmortem data from this ramp. Abort kicker traces at the time show no beam. Cryo sees heat. Tony is recovering. There are a few slow traces in the y12 region (y12-q6); this seems to indicate that this was a beam-based QLI. TJS

19:28: Yellow quench link trip was caused by 12a-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y12QFQ7_VT. The beam permit tripped after the quench link. There were 9 real magnet quenches. The quenched magnet locations are y1q7,y1q11,y1q19 ,y4q14,y5q2,y5q11,y5q15,y12q15 and y12q7. There were high beam losses g1-lm7.g1-lm11,g1-lm19,g4-lm14,y5-lm3.2,y5-lm3.1,g5-lm11,g5-lm15,g12-lm15, and g12-lm7. The loss data was from the blue dump. There is now 51 beam induced quenches for this run. Ganetis [quench]

Quench Analysis: Beam Induced Quench #051

Monday-April 19, 2004: **SQ-010 Rotator Quench Identified, 5C, File# cfe-5c-qd1, 16:53:54**
Snake Permit Fail Timestamp: N/A Beam Permit Fail Timestamp: **N/A**

Power Supply **yo5-rot3-2.3** Status: = 0.78 amps (Idle Current).
Power Supply **yo5-rot3-1.4** Status: = 0.77 amps (Idle Current).
Power Supply **bi5-rot3-2.3** Status: = 0.61 amps (Idle Current).
Power Supply **bi5-rot3-1.4** Status: = 0.63 amps (Idle Current).

Beam Loss Monitors (Rads/Hr): N/A
Postmortems / Snapshot: Shows all four Spin Rotators in 5C had tripped due to 5C-qd1 Reset. The current readings recorded above, where taken from the Snapshot Plots.

QLI Recovery TAPE / PS On Checks Commenced: **17:10:22** Estimated Time to Recovery Link: 16 minutes

Tech Notes / Sequence of Events:

Not a real magnet quench, Power Supply current levels below Quench Detection Parameters.

FitReader: cfe-5c-qd1 at 16:53:54 required a reset. (Note: New Software had been installed into the Quench Detectors recently and may be cause for the recent multiple resets required.)

Alarm Log April 19, 2004
Mon Apr 19 16:46:18 HB: cfe-5c-qd1, No Heart Beat
Mon Apr 19 16:46:53 CF: cfe-5c-qd1, response failure -> acnfec384.pbn.BNL.GOV
Mon Apr 19 16:53:56 permit.5c-ps3: input1StatusM, Quench - rotator: Permit Link FAIL

MCR LOG APRIL 19, 2004
16:45: cfe-5c-qd1 is down. MCR contacted G Ganetis; he asked us to pass on the problem to A Marusic.

16:55: A Marusic has reset 5c-qd1. The only supplies on the front end are the rotators; D Bruno is checking their health.

17:12: The rotator p.s.'s in alcove 5c have been recovered using TAPE and are set to 1 amp. I think they the p.s.'s tripped because the 5c quench detector had to be reset due to a communication problem. Don Bruno [rhic ps]

Quench Analysis: Quench Detector Reset 5c-qd1

Tuesday-April 20, 2004: PR-186, Blue Quench: File# = 1082490578

Permit ID: **10a-ps3.B** Timestamp: **15:49:36 +2239871** Beam Permit Fail Timestamp: **15:49:36 +2239900**
Quench Switches 1010A: B9DQPSW, Over Current Fault, Open Contactor, Remote On
Quench Detector(s) Trip All tripped on positive Tq values, No Auxiliary trips.
5 Minute: Quench Delay File: None Initiated.
Main Magnet Power Status: Injection Current.
Main Magnet Control (4b-ps3): No faults initiated.
Beam Loss Monitors (Rads/Hr): No Beam in Blue, Yellow Beam abort appeared normal.
Postmortems / Snapshot: At the time, there was none available for the Quench Switches.

QLI Recovery TAPE / PS On Checks Commenced: **18:59:27** Estimated Time to Recovery Link: 190 minutes

Tech Notes / Sequence of Events: Upon investigation, found that the B9DQPSW had indeed indicated OVC and that there was also a Battery Fail Light indication on the UPS-3000 that supplies the uninterrupted power to the rack. Also found the same UPS condition for Y10DQPSW existed (See Yellow PR-187 below) but yellow remained on. TAPE Recovery failed on the first attempt, Wing Louie informed that an Over Current Fault for any of the four Quench Switches located in building 1010A requires a manual reset at the switch itself. We waited as George Ganetis began to Analyze why there had been no Data stored on the Postmortems for the Quench Switches. (See MCR LOG below for details) G. Heppner

Tape Recovery Sequence:

1st Attempt: Timestamp for Tue Apr 20, 2004 = 15:56:56, B9DQPSW , Reset = NO, Fault Indicated: Over Current Fault, Open Contactor, Remote On (ERROR: Task paused due to an error, (06:49:26) User invoked cancel)
2nd Attempt: Timestamp that worked for Tue Apr 20, 2004 = 18:59:27

MCR LOG:
16:40: George and company are being hampered in their troubleshooting efforts due to a controls problem. J Laster is investigating.
17:30: QLI investigations continue after J Laster cleared up a problem with the controls database.
18:36: G Ganetis and company had found that the UPS power to the blue quench switch in 1010 was faulty due to a bad battery. A replacement has been found and is being installed.

19:47: blue quench link trip was caused by a loss of power to the b9 6K Amp quench protection switch. We believe the UPS for this switch had a bad battery and when the UPS was doing a self-check, it could not supply power to the switch and this caused the switch to open and to show a fault. Ganetis [quench]

Quench Analysis: UPS Quench Switch Batteries Failed, Replaced with New Ones.

Tuesday-April 20, 2004: PR-187, Yellow Quench: File# = 1082495916

Permit ID: **10a-ps3.B** Timestamp: **17:18:36 +918906** Beam Permit Fail Timestamp: **Down, Ref to PR-186**
Quench Switches 1010A: Testing to determine the cause of Blue B9DQPSW as Yellow Y10DQPSW also had an indication of UPS Battery Fail, MCR ramped supplies to zero currents and then we simulated fault.

QLI Recovery TAPE / PS On Checks Commenced: **19:14:28** Estimated Time to Recovery Link: 116 minutes

Tech Notes / Sequence of Events:

17:18: Quench Link Interlock in Yellow ring, 10a-ps3.B dropped first Sequencer
19:50: yellow link trip was caused by a loss of power to the y9 6K Amp quench protection switch. We turned off the UPS to do a self-check on the battery. This battery is marginal and will have to be replaced within the next couple of days. Ganetis [quench]

Quench Analysis: UPS Quench Switch Batteries Low, will replace when time permits.

Thursday-April 22, 2004: PR-188, Yellow Quench: File# = 1082631734

Permit ID: **4b-time.A** Timestamp: **07:02:12 +2496351** Beam Permit Fail Timestamp**: 06:23:12 +2464477**
Quench Switches 1010A: Replaced UPS Batteries for Y10DQPSW (Ref to Quench PR-187, File # 1082495916).
QLI Recovery TAPE / PS On Checks Commenced: **07:57:02** Estimated Time to Recovery Link: 55 minutes

Tech Notes / Sequence of Events:

7:02: Quench Link Interlock in Yellow ring, 4b-time.A dropped first Sequencer
7:39: 1) Yellow Link was tripped to replace the UPS Batteries for the Y10DQPSW Quench Switch in building 1010A. (Reference to April 20, 2004, QLI for Yellow 10a-ps3.B @ 17:18) 2) Repair a shielding wire to the connector of the Redundant DCCT for the Yellow Main Dipole. G. Heppner [rhic]
10:15: RHIC ps Maintenance performed today:

1. The UPS batteries were replaced for the yellow 6000A quench switch in 1010A Y10DQPSW).
2. The redundant DCCT was fixed for the yellow main dipole p.s.
3. A voltage monitoring board was fixed in the tunnel for testing we are doing.
4. New timing resolver software was installed in the RHIC service buildings. Don Bruno [rhic ps]

Quench Analysis: UPS Quench Switch Batteries Exchanged, Scheduled Maintenance.

Thursday-April 22, 2004: SQ-011 Snake Quench Identified, 9C, File#: K#04220855

Snake Permit Fail Timestamp: **08:59:12 + 3496586** Beam Permit Fail Timestamp: **06:23:12 + 2464446**

Magnet / Power Supply Identity: **yo9-snk7-2.3** = 323 amps (Operating Current).
Magnet / Power Supply Identity: **yo9-snk7-1.4** = 100 amps (Operating Current).
Qdplots: Indication of perturbation (heat transfer) taking place 2.11 seconds after yo9-snk7-2.3 quenched.

Magnet / Power Supply Identity: **bi9-snk7-2.3** = 326 amps (Operating Current).
Magnet / Power Supply Identity: **bi9-snk7-1.4** = 100 amps (Operating Current).
Qdplots: Indication of perturbation (heat transfer) taking place 1.97 seconds after bi9-snk7-2.3 quenched.

9C-QPA Control / Timing Resolver: No faults indicated.
Beam Loss Monitors (Rads/Hr): No beam in the machine.
Postmortems / Snapshot: Lead Flow indication on all Corrector Magnets.
QLI Recovery TAPE / PS On Checks Commenced: **12:49:26** Estimated Time to Recovery Link: 230 minutes

Tech Notes / Sequence of Events:

10:05: Both snakes quenched, waiting on Cryo to recover. JLN
10:41: No automated message? Is Sequencer on a coffee break? JPJ
10:55: There was no quench event, nor a beam abort event. Are the snakes masked? Johannes
11:31: This could have been avoided if MCR was informed and ramped the magnets down to zero before Cryo changed the bad card for the lead flow. Mei
11:35: Good observation, Johannes. I asked Dave to take a look whether the snake is masked from the permit, or just because the snake got quenched when the permit is already failed. Mei
11:53: Two snake magnets, bi9-snk7-2.3 and yo9-snk7-2.3 tripped due to gas cooled lead faults on the 9c-qd1 quench detector. The Cryo group was fixing a flow read back problem at the time and they reduced the flow at least 10 min. before the quench detector tripped. There was not a problem with the flow before they went to fix their read back problem. Also bi9-snk7-1.4 and yo9-snk7-1.4 quenched due to warm gas caused by the other snake magnets quenching. Ganetis [quench]
11:58: The permit data for 9/9c shows that the quench indicator for the snake is in the permit and is unmasked (and has failed at 08:59:12, the time the yellow snake quenched) JLN
13:46: Permit was down already when the snake quench happened at 8:59 so there was no beam abort event.
We don't expect a quench event for a snake quench. The snake PS data is captured by the "snapshot" part of the postmortem system (and it has data for the 8:59 snake quenches). So I think that this all behaved just as it was supposed to. Jtm

Quench Analysis: Cryogenics – Lead Flow Fault / Bad Card.

Sunday-April 25, 2004: **PR-189, Blue Quench: File# = 1082939649**
Permit ID: **9b-ps1** Timestamp: **20:34:08 +1654106** Beam Permit Fail Timestamp**: 20:34:08 + 1654136**
Quench Detector(s) Trip (9b-qd1) B8DSA4_A3VT Int. 20, Tq=-24
5 Minute: Quench Delay File: None Initiated.
Main Magnet Power Status: Store Energy, Ramp down sequence begun:
Dipole tripped at: 1931.08 amps, Quad tripped at: 1872.96 amps.
Main Magnet Control (4b-ps3): No faults initiated.
Beam Loss Monitors (Rads/Hr): Indicates that there was no beam in the machine.
Postmortems / Snapshot: Nothing found unusual.

QLI Recovery TAPE / PS On Checks Commenced: **20:53:30** Estimated Time to Recovery Link: **Ref to PR-191**

Tech Notes / Sequence of Events:
OC_log_2004 Shift-end Summary: Time Logged: Apr 26 2004 00:35:27AM:
20:41: We suffer a quench link interlock in both blue and yellow rings after an activate command was accidentally sent to the rotator ramp rather than the main ramp in RHIC. We consulted with J. van Zeijts after the error occurred, and he advised to run the Rot Down sequence and reactivate the main ramp. However, upon running the Rot Down sequence, the quench link interlock occurred. We are working to ramp all references to park and begin quench link recovery.

21:32: Both rings have successfully recovered, although we had to run recovery in the blue ring a second time after the quench link tripped immediately after the first attempt at recovery.

Apr 26 2004 9:20: Both the blue and yellow link trips were caused by arc quench detectors. The quench detectors tripped because the magnets were ramped down to fast. The ramp used a slow factor of 1 instead of the required 3. Could Al Marusic please look into why this happened? Ganetis [quench]

Quench Analysis: Wrong Ramp sequence used.

Sunday-April 25, 2004: **PR-190, Yellow Quench: File# = 1082939649**
Permit ID: **3b-ps1** Timestamp: **20:34:08 +1683724** Beam Permit Fail Timestamp**: 20:34:08 + 1654126**
Quench Detector(s) Trip: (3b-qd1) Yellow Quenched, Y2DSA4_A3VT Int. 20, Tq=-24
5 Minute: Quench Delay File: None initiated.
Main Magnet Power Status: Store Energy, Ramp down sequence begun:
Dipole tripped at: 1931.85 amps, Quad tripped at: 1876.64 amps.
Main Magnet Control (4b-ps3): Normal Alarm response.
Beam Loss Monitors (Rads/Hr): Indicates that there was no beam in the machine.
Postmortems / Snapshot: Nothing seen unusual.
QLI Recovery TAPE / PS On Checks Commenced: **21:28:46** Estimated Time to Recovery Link: 54 minutes

Tech Notes / Sequence of Events: (See Blue PR-189 for details.)

Quench Analysis: Wrong Ramp sequence used.

Sunday-April 25, 2004: **PR-191, Blue Quench: File# = 1082940795**
Permit ID: **10a-ps3.A** Timestamp: **20:53:12 +3701939** Beam Permit Fail Timestamp**: 20:34:08 + 1654110**
Checking QPA Control: QP09-R10ABQF5-bi9-qf7-qp, no faults listed.
Quench Detector(s) Trip All Systems Running.
5 Minute: Quench Delay File: N/A
Main Magnet Power Status: Park Currents.
Main Magnet Control (4b-ps3): No faults initiated.
Beam Loss Monitors (Rads/Hr): No beam in the machine, recovering from previous quenches.
Postmortems / Snapshot: Nothing found unusual.

QLI Recovery TAPE / PS On Checks Commenced: **21*:18:50*** Estimated Time to Recovery Link: 44 minutes

TAPE Recovery: Timestamp for Sun, Apr 25, 2004 = 21:16:52
Fault: #103, bo10-tq6-ps, command = On, status = Stby
ERROR: Task paused due to an error, (09:18:44 User invoked retry)
#104, bo10-tq6-ps, command = On, status = On, (09:18:50 User exit)

Tech Notes / Sequence of Events:
Alarm Log Indicates: Quench / Standby-Error
QED: supports the fault listed : | bi9-qf7-ps | Stby-Error | AC Power, Standby, Remote, Error signal, Quench

20:53: Quench Link Interlock in Blue ring, 10a-ps3.A dropped first Sequencer

22:07: I think this blue Quench Link Interlock was due to p.s. bi9-qf7-ps trying to turn on and then tripping back to STBY again because of a problem with its aux contacts for ON status. We will put this on our maintenance list to be fixed. Don Bruno [rhic ps]

Quench Analysis: Power Supply Auxiliary Contact On status fail, bi9-qf7.

Tuesday-April 27, 2004: SQ-012 Spin Quench Identified, Yellow-5c-ps1, File#:

File# 1083039211 = 1st Snake Permit Fail Timestamp: Apr 27 00:13:28 + 3503383 / Apr 27 00:46:00 + 2946187
File# 1083041162 = 2nd Beam Permit Fail Timestamp: Apr 27 00:13:28 + 3503423 / Apr 27 00:46:00 + 2946228
Permit Corrected: Apr 27 00:49:04

Magnet / Power Supply Identity: **yo5-rot3-2.3**
5c-QPA Control / Timing Resolver: No faults indicated, both supplies tripped.
Power Supply Status: = at operating current of 175.29 amps
Beam Loss Monitors (rads/hr): Monitors around the 5C Snake Magnets, minimal to none.
Quench Recovery Time set to ON: Tue Apr 27 00:47:29 EDT 2004

Magnet / Power Supply Identity: **yo5-rot3-1.4**
Power Supply Status: = Operating Current of 211.99 amps.
Qdplots: Indication of perturbation (heat transfer) taking place 2.66 seconds after **yo5-rot3-2.3** quenched.
Quench Recovery Time set to ON: Tue Apr 27 00:46:09 EDT 2004

Estimated Recovery Time: 33 minutes

Tech Notes / Sequence of Events:
Yo5-rot3-2.3-ps, while sitting at operating current, a sudden increase in Iref that causes the current and Voltage to jump with too fast of a change, caused the Quench Detector to trip, quenching the magnet. Yo5-rot3-1.4 tripped 2.66 seconds after due to perturbation (heat transfer) caused by the yo5-rot3-2.3 magnet quench. G. Heppner

13:45: Rotator trip was caused by 5c-qd1 quench detector. The quench detector tripped because yo5-rot3-2.3-ps had a sudden increase current. It was a 4.2 Amp increase in .15 sec. The quench detector cannot work at these ramp rates. This is a power supply problem and D. Bruno is investigating. The beam permit tripped after the snake trip. Magnet yo5-rot3-1.4 also quenched due to warm gas from the yo5-rot3-2.3 quench. Ganetis [quench]

Quench Analysis: Snake Power Supply Induced Quench

Tuesday-April 27, 2004: PR-192, Yellow Quench: File# = 1083039216

Permit ID: **6b-ps1** Timestamp: **00:13:36 +275742** Beam Permit Fail Timestamp: **00:13:28 +3503387**
Quench Detector(s) Trip: (6b-qd2) Y5QFQ6_4VT Int. 20, Tq=-25
5 Minute: Quench Delay File: None initiated.
Checking QPA Control: y-BP-QLI-YI4, y-QD-QLI-YI1
Main Magnet Power Status: Store Energy, Dipole tripped at: 1946.76 amps, Quad tripped at: 1890.56 amps.
Beam Loss Monitors (Rads/Hr): 00:13:31 Beam Abort Saved, sector 5 shows no substantial losses. Beam Dump Yellow Sector 9 appears good. Last Yellow Dump saved is April 26, 2004 at 17:53:17.
Postmortems / Snapshot: yo5-qf8-ps shows a slow current drop and voltage rise 0.08 seconds prior to T=zero. (Indications of beam induced quench. However, there appears to have been no beam losses in this area.)

QLI Recovery TAPE / PS On Checks Commenced: **00:45:00** Estimated Time to Recovery Link: 54 minutes

Tech Notes / Sequence of Events: Quench event occurs approximately 5 minutes after the yo5-rot3-2.3 and 1.4 magnets quenched. There is a heat transfer due to the Cryogenics flow in the counterclockwise direction that causes the quench detector to trip because of Y5QFQ6_4VT = Yellow Quad, Sector 5, Focus magnets Q6, Q5 and Q4 sensed the magnets going normal. G. Heppner.

13:46: yellow quench link trip was caused by 6b-qd2 quench detector. The quench detector tripped because of a real bus quench at Y5QFQ6_4VT. The beam permit tripped before the quench link when yo5-rot3-2.3 rotator tripped. The bus quenched due to warm gas from the yo5-rot3-2.3 quench. Ganetis [quench]

Quench Analysis: Cryogenic warm gases due to Yo5-rot3-2.3 & 1.4 Quench. (Ref to SQ-012)

Wednesday-April 28, 2004: PR-193, Yellow Quench: File# = 1083133809

Permit ID: **8b-ps1** Timestamp: **02:30:08 +1294589** Beam Permit Fail Timestamp: **02:30:08 + 1285904**
Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT Int. 5, Tq=-24, No Auxiliary trips.
5 Minute: Quench Delay File: 8b-qd2, Y8QFQ2_VT (Sector 8 Triplet, Quad Focus Q2 Magnet)
Checking QPA Control: y-B1-QLI-YI4, y-QD-QLI-YI1
Main Magnet Power Status: Store Energy, Dipole = 1946.76amps, Quad = 1891.12 amps.
Beam Loss Monitors (Rads/Hr): High losses at g8-lm1 = 2113.88 and Medium losses at y8-lm0 = 1150.04
Postmortem / Snapshot: 1008B, Supplies ramping, no indications that supplies caused the event. However, yo8-qd1, yo8-qf2, yo8-qd3 and y8-q6 all show indications of possible beam or heat induction occurring in the area.

QLI Recovery TAPE / PS On Checks Commenced: **02:50:50** Estimated Time to Recovery Link: 21minutes

Tech Notes / Sequence of Events:
2:27: RHIC acceleration ramp started, ramp id pp19_1083132282 Sequencer
2:30: Quench Link Interlock in Yellow ring, 8b-ps1 dropped first Sequencer
2:30: Beam Abort, 8b-ps1 dropped {Loss Monitor 1} Sequencer
2:40: We lost the beam at the t175 stone, so I'm putting back the vertical chromaticity from the previous ramp. trav
2:42: Yellow quench recovery sequence begun tape

9:47: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped .009 sec. before the quench link. There was one real quench at y8q2. There was low to moderate beam losses for seconds at g8-lm.1. There is now 52 beam induced quenches for this run. What are the thresholds for the blms for the triplets? Are they too high? Ganetis [quench]

Quench Analysis: Beam Induce Quench #052

Wednesday-April 28, 2004: PR-194, Yellow Quench: File# = 1083138150

Permit ID: **8b-ps1** Timestamp: **03:42:28 +2990898** Beam Permit Fail Timestamp: **03:42:28 + 2959353**
Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT Int. 5, Tq=-24, No Auxiliary trips.
5 Minute: Quench Delay File: 8b-qd2, Y8QFQ2_VT (Sector 8 Triplet, Quad Focus Q2 Magnet)
Checking QPA Control: y-B1-QLI-YI4, y-QD-QLI-YI1
Checking Main Magnet / Qdplots: Store Energy, Dipole = 1946.76amps, Quad = 1891.21 amps.
Beam Loss Monitors: High losses at g8-lm1 = 2189.10 and Medium losses at y8-lm0 = 1272.47
Postmortem / Snapshot: 1008B, Supplies ramping, no indications that supplies caused the event. However, yo8-qd1, yo8-qf2, yo8-qd3 and y8-q6 all show indications of possible beam or heat induction occurring in the area.

QLI Recovery TAPE / PS On Checks Commenced: **04:05:26** Estimated Time to Recovery Link: 23minutes

Tech Notes / Sequence of Events:
3:39: RHIC acceleration ramp started, ramp id pp19_1083136710 Sequencer
3:40: AGS extraction is again drifting... (Paste to previous graphic)
3:42: Beam Abort, 8b-ps1 dropped {Loss Monitor 1} Sequencer
3:42: Quench Link Interlock in Yellow ring, 8b-ps1 dropped first Sequencer
3:56: Yellow quench recovery sequence begun tape

9:48: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped .009 sec. before the quench link. There was one real quench at y8q2. There was low to moderate beam losses for seconds at g8-lm.1. There is now 53 beam induced quenches for this run. What are the thresholds for the blms for the triplets? Are they too high? Ganetis [quench]

Quench Analysis: Beam Induce Quench #053

Thursday-April 29, 2004: PR-195, Blue Quench: File# = 1083217608

Permit ID: **10a-ps3.A** Timestamp: **01:46:48 +946540** Beam Permit Fail Timestamp**: 01:46:48 + 937634**

Quench Detector(s) Trip All Main QD's tripped indicating positive Tq values, No Auxiliary trips.
5 Minute: Quench Delay File: None Initiated
Main Magnet Power Status: Injection Current
Beam Loss Monitors (Rads/Hr): Beam had been dumped prior to event.
Postmortems / Snapshot: Nothing found unusual, supplies running at Injection Currents.

QLI Recovery TAPE / PS On Checks Commenced: **02:06:38** Estimated Time to Recovery Link: 20 minutes

Tech Notes / Sequence of Events:

1) Fit Reader verified that an AC reset to cfe-3b-ps1 was done. 2) The Quench Summary Page indicated that all signals for 3b-ps1 where in the Pink. G. Heppner

01:12: Beam dumped.
01:37: MCR reset 3b-ps1 (no heartbeat).
01:51: 3b-ps1 did not come back with a reset. An AC reset was necessary, pulling the quench link (response instructions state that an AC reset will pull the permit OR quench link - more specificity would be helpful). Running recovery sequences.
02:07: Hysteresis ramp.

Quench Analysis: cfe 3b-ps1 no Heartbeat, AC Reset Required.

Thursday-April 29, 2004: PR-196, Yellow Quench: File# = 1083217608

Permit ID: **12a-ps1.A** Timestamp: **01:46:48 +951003** Beam Permit Fail Timestamp**: 01:46:48 + 937641**

Quench Detector(s) Trip: All Main QD's tripped indicating positive Tq values, No Auxiliary trips.
Checking Main Magnet / Qdplots: Injection Current
Beam Loss Monitors (Rads/Hr): Beam had been dumped prior to event.
Postmortems / Snapshot: Nothing found unusual, supplies running at Injection Currents.

QLI Recovery TAPE / PS On Checks Commenced: **02:03:55** Estimated Time to Recovery Link: 18 minutes

Tech Notes / Sequence of Events:

1) Fit Reader verified that an AC reset to cfe-3b-ps1 was done. 2) The Quench Summary Page indicated that all signals for 3b-ps1 where in the Pink. G. Heppner

01:12: Beam dumped.
01:37: MCR reset 3b-ps1 (no heartbeat).
01:51: 3b-ps1 did not come back with a reset. An AC reset was necessary, pulling the quench link (response instructions state that an AC reset will pull the permit OR quench link - more specificity would be helpful). Running recovery sequences.
02:07: Hysteresis ramp.

Quench Analysis: cfe 3b-ps1 no Heartbeat, AC Reset Required.

RHIC 2003 – 2004 Physics Run
Daily Quench Analysis for the month of April 2004

Scheduled Maintenance 1100 to 1500 (actual start time was 1150)

Thursday-April 29, 2004: **PR-197, Blue Quench: File# = 1083254782**
Permit ID: **2b-ps1** Timestamp: **12:06:20 +2832792** Beam Permit Fail Timestamp**: 11:39:36 for Maint.**
Quench Detector(s) Trip 2b-qd1 (No FEC/DSP HS) cfe-2b-qd1
5 Minute: Quench Delay File: None Initiated
Main Magnet Power Status: Ramped to Zero from MCR.
DX Heaters: All four in Sector 2:
2b-ps2.A1 (Off) cfe-2b-ps2 / 2b-ps2.A2 (Off) cfe-2b-ps2 / 2b-ps2.B1 (Off) cfe-2b-ps2 / 2b-ps2.B2 (Off) cfe-2b-ps2

Thursday-April 29, 2004: **PR-198, Yellow Quench: File# = 1083254794**
Permit ID: **2b-ps1** Timestamp: **12:06:32 +2103229** Beam Permit Fail Timestamp**: 11:39:36 for Maint.**
Quench Detector(s) Trip 2b-qd1 (No FEC/DSP HS) cfe-2b-qd1
5 Minute: Quench Delay File: None Initiated
Main Magnet Power Status: Ramped to Zero from MCR.

Tech Notes / Sequence of Events: FitReader indicated that a reset had been done to the 2b-qd1 at 12:06:23 and then 2b-qd2 had been reset at 12:06:33. This would cause the DX Heaters to fire in Blue. Timestamps for the permit fail corresponds with FitReader. Not charged against quench detectors because this was scheduled and done during the maintenance period. G. Heppner

Thursday-April 29, 2004: **PR-199, Yellow Quench: File# = 1083265000**
Permit ID: **4b-time.B, Yellow Main PS** Timestamp: **14:56:40 +852088** Beam Permit Fail Timestamp**: N/A, Maint.**
Main Magnet Power Status: Ramp test in progress: y-dmain-ps: (Reg Error)
Mains at Store Energy for Gold (Au) the are seen ramping down:
Dipole Store = 5043 amps, tripped at 4899 amps
Quad Store = 4621 amps, tripped at 4488 amps

Thursday-April 29, 2004: **PR-200, Blue Quench: File# = 1083265003**
Permit ID: **4b-time.B, Blue Main PS** Timestamp: **14:56:40 +3094788** Beam Permit Fail Timestamp**: N/A, Maint.**
Main Magnet Power Status: Ramp test in progress: b-dmain-ps: (Reg Error)
Mains at Store Energy for Gold (Au) the are seen ramping down:
Dipole Store = 5041 amps, tripped at 4831 amps
Quad Store = 4617 amps, tripped at 4373 amps

Cause of both 4b-time.B Quenches: Testing of Fast Ramps for High Energy Gold Run for next year. The coefficients for the ramps had to be changed as they are currently set for the Polarized Proton Run! Not a real quench. G. Heppner

Blue QLI Recovery TAPE / PS On Checks Commenced: **15:37:56** Estimated Time to Recovery Link: 211 minutes
Yellow QLI Recovery TAPE / PS On Checks Commenced: **15:46:23** Estimated Time to Recovery Link: 220 minutes

Tech Notes / Sequence of Events:
17:44: RHIC ps maintenance performed today: 1. Corrector yo5-octf-ps was swapped out today because it was tripping on an error signal fault. Loose ac connections were found. 2. The low-res card and slew rate limiter setpoint card were swapped out of yo5-rot3-2.3-ps. 3. Put up plastic sheeting to protect yo5-rot3-2.3-ps from the rain. 4. Ramping the p.s.'s was done with the Gold and Proton ramps to save data so we can go faster on the down-ramps. George will probably put more details in the e-log about this later. Don Bruno [rhic ps]
18:15: G. Ganetis reported that he has completed his RHIC ramp tests. He has performed two hysteresis cycles for the pp19 ramp.
20:15: Cycling RHIC through a hysteresis ramp.

Quench Analysis: Scheduled Maintenance.